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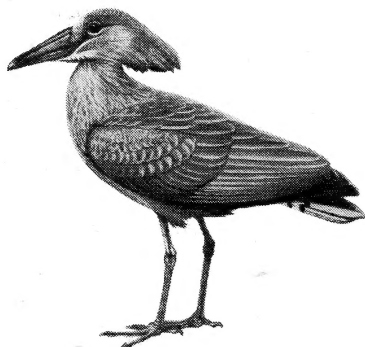
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Continued inside back cover

Forest birds on Mt Kilimanjaro, Tanzania

N. J. Cordeiro

Mt Kilimanjaro, situated in northeast Tanzania, is composed of three peaks, Kibo being the central and highest (5895 m) with Shira and Mawenzi on either side (Fig. 1). Several studies have been conducted on the flora and fauna of this mountain. The vegetation has been described by various authors (e.g. Hedberg 1951, Salt 1954, Greenway 1965, Mwasaga 1991) and the mammals (e.g. Moreau 1944, Guest & Leedal 1954, Child 1965, Grimshaw & Foley 1991), birds (e.g. Moreau 1936, Moreau

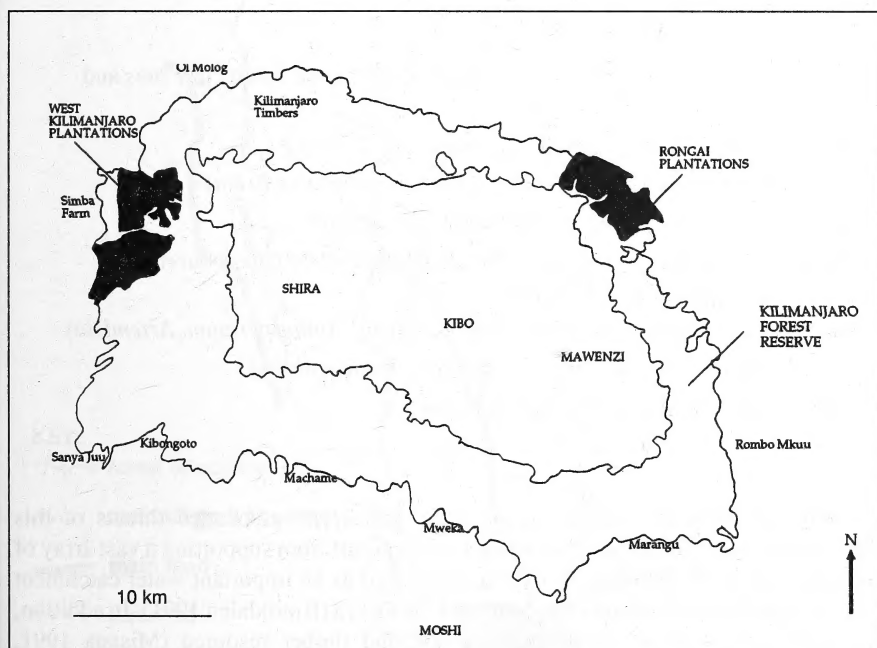


Figure 1. Map showing the forest reserve and conifer plantations on Mt Kilimanjaro

& Moreau 1939, Lamprey 1965, King 1973) and invertebrates (Salt 1954, Cordeiro in prep.) have received significant attention. The flora and fauna have also been examined from a biogeographical perspective (e.g. Moreau 1966, Kingdon 1981, Rogers *et al.* 1982, Newmark *et al.* 1991, Pócs 1991, Stuart *et al.* 1993).

In view of the environmental degradation in East Africa, research has concentrated on forest habitats throughout the region. This is also true of Kilimanjaro; a volume of

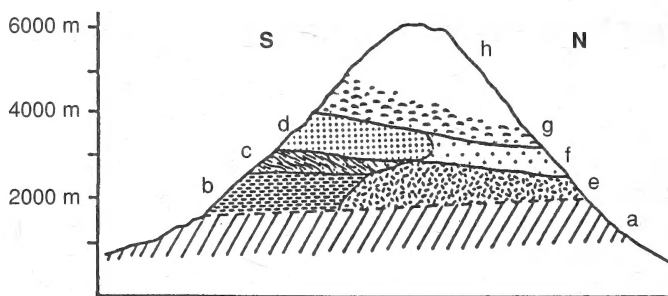


Figure 2. The vegetation belts of Mt Kilimanjaro (from Pócs 1991)

Key

- a The cultivated zone (coffee, wheat, bananas, plantation forests of *Pinus* and *Cupressus*)
- b Montane rainforest (dominated by *Ocotea*)
- c Mossy montane rainforest (dominated by *Podocarpus* or *Erica*)
- d Subalpine ericaceous heath (dominated by *Philippia*)
- e Montane mesic and dry evergreen forest (dominated by *Cassipourea* and *Cascaria* or by *Olea* and *Juniperus*)
- f Subalpine ericaceous bush (dominated by *Stoebe*, *Anthospermum*, *Artemisia*)
- g Alpine tussock (dominated by *Helichrysum*, *Pentaschistes*)
- h Alpine desert (dominated by bare rock and ice)

research was compiled on the conservation values and associated threats of this mountain's natural resources (Newmark 1991c). Apart from supporting a vast array of flora and fauna, Mt Kilimanjaro is also recognized as an important water catchment area for northeastern Tanzania and southeastern Kenya (Bjørndalen 1991). In addition, the forest serves as an important fuelwood and timber resource (Misana 1991, Newmark 1991c). Despite some attention, this forest ecosystem remains only partially understood and in order to conserve this valuable asset, further research is essential on the many variables that make up Kilimanjaro's ecosystem.

Although Mt Kilimanjaro did not qualify as a forested area of particular importance for the conservation of Afrotropical avifauna (Collar & Stuart 1988), three species occurring on the mountain are listed as candidate threatened or near-threatened (Table 2). These birds and many other forest birds could be threatened by increased exploitation of the forest. Hence, it is because of the destruction of this important forest and the little that is known about altitudination of forest birds on Mt Kilimanjaro that this study was conducted.

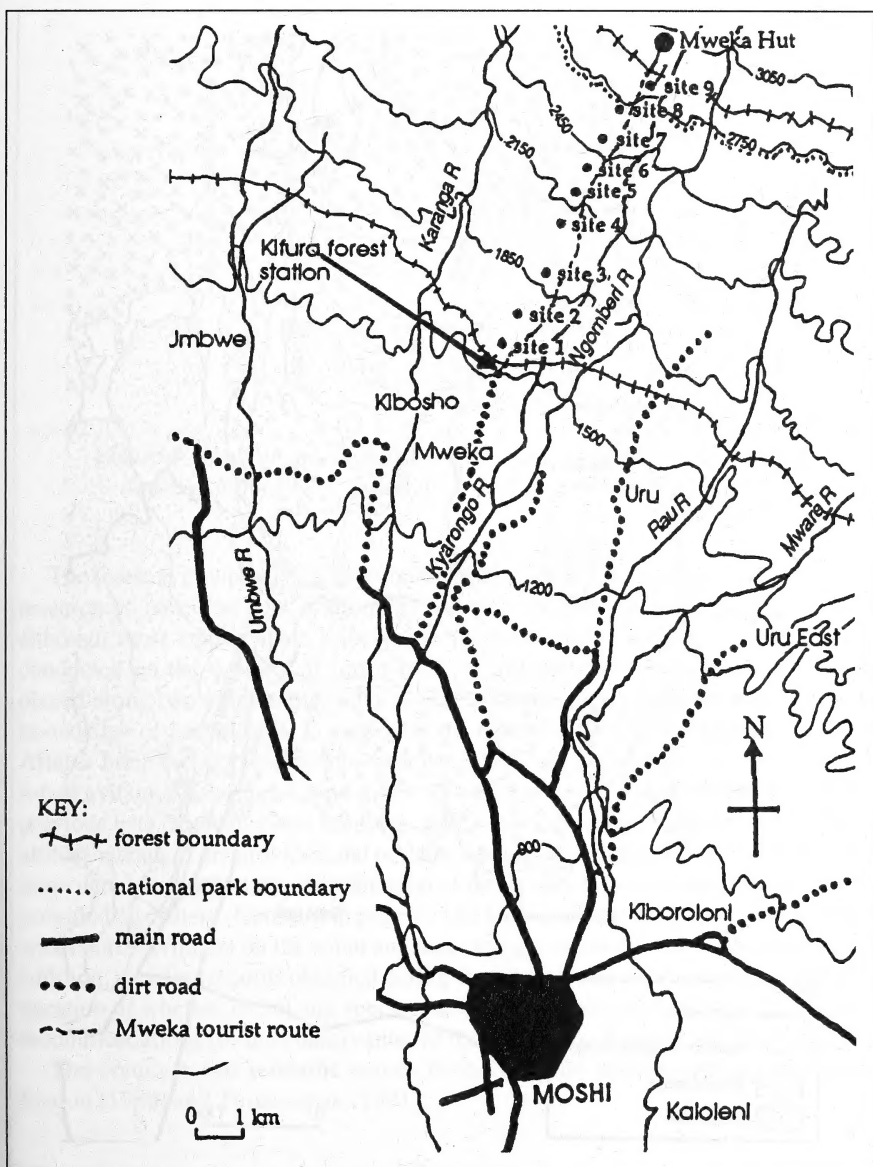


Figure 3a. Location of sites on the south slope of Mt Kilimanjaro

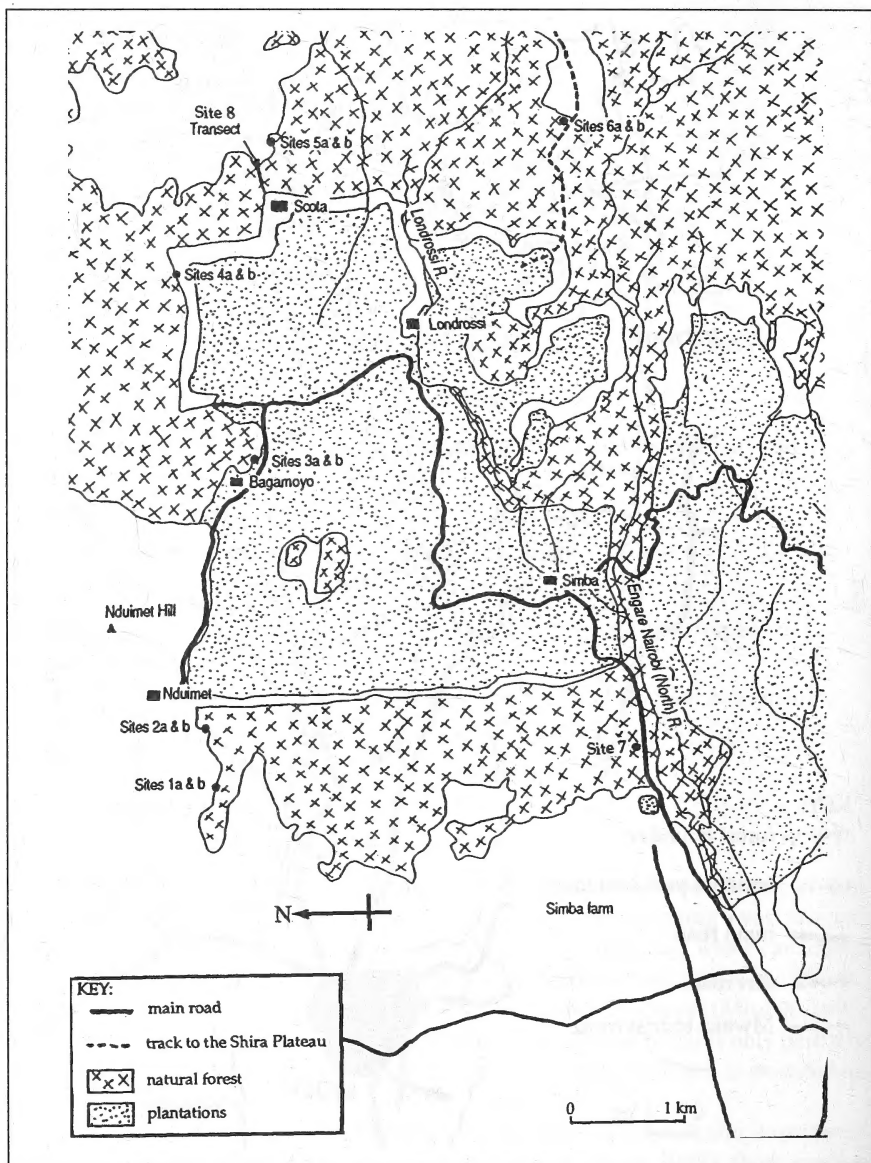


Figure 3b. Location of sites on the west slope of Mt Kilimanjaro

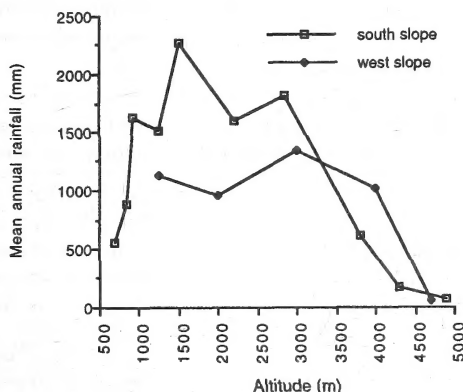


Figure 4. Rainfall patterns on west and south slope of Mt Kilimanjaro
 Sources: Salt (1955), Kundaelli (1976), Sarmett & Faraji (1991)

The forest avifauna of Mt Kilimanjaro has been examined in some detail by various researchers (see Previous ornithological work on Kilimanjaro, below). However, although most studies have been in the form of species lists, very little has been conducted on the ecology of forest birds of this mountain. Hence, using mist-nets placed along two altitudinal gradients on the mountain, an attempt to gather further knowledge of forest birds, in particular the understorey dwellers, is presented here. After a brief section on previous ornithological investigations of the mountain, the forest avifauna is examined and a few species have been deleted from, or added to, previous lists (Moreau 1944, Lamprey 1965). Ecological and distributional notes and altitudinal ranges are provided and possible vertical seasonal movements indicated. [A more detailed paper on the altitudinal of forest understorey birds on Kilimanjaro is provided elsewhere (Cordeiro in prep.)]. The similarities and differences between the understorey avifauna on the south and west aspects of the mountain are compared. In addition, breeding records obtained during the study period are discussed as well as the question of whether or not any species have become extinct on Kilimanjaro. Finally, recommendations for the conservation of forest birds on Kilimanjaro are given.

The common and scientific names in the text and accompanying tables follow Britton (1980) and Turner *et al.* (1991).

Study area

The vegetation of Mt Kilimanjaro occurs as a series of belts which vary in their characteristics and upper and lower limits according to aspect (Hedberg 1951; Pócs 1991; Fig. 2). This study concentrates on the forest which has been described by Greenway (1965), Steele (1966a, b), Wood (1965a, b) and Mwasaga (1991). Since

Table 1. *Some site characteristics on the western and southern gradients***Western gradient (Forest limits 1650–2550 m)**

site	altitude (m)	level of disturbance	density & canopy height (m)	forest type & dominant trees, shrubs and herbs (genera)
1	1750	xeric; disturbed	dense; 20–25	<i>Teclea</i> , <i>Olea</i> , <i>Bersama</i> , <i>Ilex</i> , <i>Hibiscus</i> , <i>Justicia</i>
2	1900	xeric, disturbed	not very dense; 25	<i>Teclea</i> , <i>Bersama</i> , <i>Ilex</i> , <i>Olea</i> , <i>Hibiscus</i> , <i>Justicia</i>
3	2050	xeric, slightly disturbed	very dense; 25–30	<i>Teclea</i> , <i>Olea</i> , <i>Markhamia</i> , <i>Senecio</i> , <i>Piper</i>
4	2200	xeric, disturbed	not dense; 20–25	<i>Teclea</i> , <i>Olea</i> , <i>Senecio</i> , <i>Piper</i> , <i>Vernonia</i> , <i>Ureracea</i>
5	2350	xeric, very disturbed	thin; 20	<i>Teclea</i> , <i>Nuxia</i> , <i>Justicia</i> , <i>Vernonia</i> , <i>Ureracea</i>
6	2500	xeric, intact	dense; 25–35	<i>Podocarpus</i> , <i>Juniperus</i> , <i>Nuxia</i> , <i>Digitaria</i> , moss
7	1700	xeric, almost intact	dense; 20–30	<i>Teclea</i> , <i>Ilex</i> , <i>Olea</i> , Rubiaceae shrubs
8	2350	xeric, very disturbed	thin; 15–25	<i>Teclea</i> , <i>Olea</i> , <i>Vernonia</i> , <i>Ureracea</i> , <i>Crotolaria</i> , <i>Justicia</i> ,

Southern gradient (Forest limits 1500–3000 m)

1	1600	wet; disturbed	dense; 25–30	<i>Macaranga</i> , <i>Ocotea</i> , <i>Taber- naemontana</i> , <i>Psychotria</i> , Rubiaceae shrubs
2	1750	wet; disturbed	dense; 25–30	<i>Macaranga</i> , <i>Ocotea</i> , <i>Taber- naemontana</i> , <i>Psychotria</i> , Rubiaceae shrubs
3	1900	wet; disturbed	dense; 25–30	<i>Macaranga</i> , <i>Ocotea</i> , <i>Taber- naemontana</i> , Rubiaceae shrubs
4	2050	wet; intact	dense; 25–35	<i>Ocotea</i> , <i>Schefflera</i> , <i>Macaranga</i> , Rubiaceae shrubs, moss
5	2200	wet; slightly disturbed	dense; 20–30	<i>Ocotea</i> , <i>Schefflera</i> , <i>Podocarpus</i> , Rubiaceae shrubs, Moss
6	2350	wet; intact	dense; 20–30	<i>Ocotea</i> , <i>Schefflera</i> , <i>Podocarpus</i> , Rubiaceae shrubs, Moss
7	2500	wet; intact	not so dense; 20–25	<i>Podocarpus</i> , <i>Erica</i> , <i>Maytenus</i> , <i>Diplachne</i> , <i>Cyperis</i> , moss
8	2650	wet; intact	not so dense; 20–25	<i>Podocarpus</i> , <i>Erica</i> , <i>Maytenus</i> , <i>Schefflera</i> , <i>Diplachne</i> , <i>Cyperis</i> , moss
9	2800	wet; intact	not so dense; 20–25	<i>Podocarpus</i> , <i>Erica</i> , <i>Hagenia</i> , <i>Maytenus</i> , <i>Diplachne</i> , <i>Cyperis</i> , moss

1958, the forest has been severely fragmented (Wood 1965b, Lamprey *et al.* 1991; see Fig. 1). Two fairly large softwood plantations now occupy much of the western and north-eastern slopes, having replaced 6200 ha of indigenous forest (Lamprey *et al.* 1991; Fig. 1). Thus, the forest belt is now almost broken in two places, except at its uppermost altitudes where narrow corridors (c. 1 km wide) link the two strips.

The climate varies with aspect: the northern and western aspects receive significantly less rainfall than the southern and southeastern slopes (e.g. Sampson 1965, Kundaelli 1976, Misana 1991). The southeast trade wind brings heavy rainfall from March to May (long rains) and the drier northeast monsoon rains fall from late October to December (short rains) (e.g. Salt 1955, Maro 1988, Misana 1991). Thus the southern face of the mountain receives most of the annual rain during the long rainy season and the eastern slope receives its maximum rainfall during the short rains (Maro 1988). Rainfall increases with elevation up to 2400–3000 m and then decreases with altitude (Maro 1988; see Fig. 4). Temperature decreases with increasing elevation (Maro 1988, Sarmett & Faraji 1991).

Forest birds were surveyed along two altitudinal gradients on the south and west slopes. Successive sites along these gradients were separated by 150 m altitude and spanned the entire natural forest belt (see Table 1). Most sites on the west slope were situated in the natural forest bordering the West Kilimanjaro conifer plantations and sites on the southern aspect located along the Mweka tourist route (Figs. 3a, 3b; Table 1). Since most of the forest on Mt Kilimanjaro has been affected by humans over the centuries, many of the sites were situated in forest that was secondary in nature with different levels of disturbance (Table 1).

On the xeric western slope, the forest is somewhat dense throughout, except in places where selective logging has degraded the vegetation. There are no obvious changes in the dominant trees below 2400 m, but above this, *Podocarpus*, *Juniperus* and *Nuxia* predominate (Table 1). Parts of the forest edge near Nduimet village were subjected to fires in recent years (Nduimet villagers, pers. comm.). A small patch of forest that was indicated on the Kilimanjaro Forest Reserve Map (SC 1988) no longer exists, probably as a result of such fires.

The southern gradient contains a similar plant community at most elevations. The forest is relatively denser from 1600 m to 2350 m, and much of the vegetation remains somewhat similar with changes in the dominance of some species (Table 1). However, the greatest change in the vegetational structure occurs somewhere between 2500 m and 2650 m, where the forest is much thinner, comprising of *Podocarpus* and *Erica* tree stands (Table 1).

Materials and Methods

Sampling birds

In order to determine the understorey bird species present at the various elevations, ten Avinet mist nets (2 x 13 m) were operated from dawn to dusk at each site. Nets were mounted between poles with the bottom shelf-string at ground-level. Birds were

removed at half-hour to hour intervals depending on the capture rate.

All birds were fitted with Eastern African Ringing Scheme rings and the following biometrics were taken: (i) wing length; (ii) tail length; (iii) tarsus length; (iv) bill length. Other data such as weight, sex (where possible), breeding condition and moult state were obtained for all birds. Birds were identified in the field using Mackworth-Praed & Grant (1957, 1960), Britton (1980), Williams & Arlott (1980) and Maclean (1988).

Each site was surveyed for at least 36 mist-netting hours, (i.e. 3 days from dawn to dusk), using the cumulative species surveying technique (Newmark 1991a & pers. comm). The western slope was surveyed from late August to mid-October (54,860 net-m-h), and the southern slope from late October to early December, 1991 (42,380 net-m-h). Two additional sites, which includes the natural corridor, were surveyed on the western gradient in December (13,065 net-m-h; see Fig. 3b). In addition, all species seen or heard in the field were recorded.

Breeding Records

All active nests, dependent juveniles, courting behaviour or adult birds with fresh brood patches were recorded. In the case of fledglings and juveniles, records were back-dated to the nearest laying month. Nest-building and courtship behaviour were considered as suspected breeding records only. Brood patch as a measure of breeding activity is reliable (Tye 1992) and only very fresh, fully developed brood patches were accepted as breeding records. Species that had bare breasts, e.g. as a result of moulting, were excluded. In addition, some birds that had less developed brood patches but may have been breeding, were also excluded.

Previous ornithological work on Kilimanjaro

Mt Kilimanjaro has received a considerable amount of ornithological attention and many species and races were described from this mountain (e.g. Abbott's Starling *Cinnyricinclus femoralis*, Oriole Finch *Linurgus olivaceus kilimensis*). Moreau (1950a) reviewed the ornithology of Tanzania up to the early 1950s, providing a brief summary on the avifaunal investigations of Mt Kilimanjaro. Nevertheless, it is important to recount the earlier contributors to this mountain's ornithology.

Sir H. Johnston first collected bird specimens on the mountain in 1884, many of which were new to science. Soon after (1890s) Kretschmer, Abbott, von der Marwitz and Neumann made several collections. They were followed by K. Kittenberger, Schillings and Sjöstedt, all of whom made substantial collections during the very early 1900s (Moreau 1950a). The resulting publications were mainly in the form of taxonomic descriptions and annotated species lists (e.g. Shelley & Johnston 1886, Oberholser 1905, 1906, Kittenberger 1958, 1959).

Several years later, some naturalists explored the mountain and made a few notable records (e.g. van Someren 1931, 1932). However, it was not until 1932 that Moreau

visited and collected specimens from there. He compared the forest and alpine avifauna of Mt Kilimanjaro with that of Mt Meru (Moreau 1936) and Mt Kenya (Moreau 1944) as well as with other mountains (Moreau 1966). After further investigation on the north slope in 1938, he recorded species new to the mountain (Moreau & Moreau 1939). Subsequently, Guest & Leedal (1954) made further incidental records of various birds.

More recently, some authors briefly described the altitudination of forest and alpine birds from field observations (Lamprey 1965, King 1973). During the 1970s and 1980s, Dr H. Grossman (pers. comm.) surveyed and documented the altitude ranges and ecology of the Mt Kilimanjaro avifauna from field observations. After some years of absence, he has continued this work up to the present (Grossman unpublished).

Hence, this study provides further details on the ecology of forest birds on this mountain by using mist-nets. Nevertheless, the forest avifauna has not been thoroughly investigated here, and given that the southeast, south and southwest slopes have been studied the most by previous researchers, a large area remains to be explored.

Results

Additions and deletions to the forest avifauna

The forest avifauna of Mt Kilimanjaro was previously described by Moreau (1936, 1944, 1966), Moreau & Moreau (1939), and Lamprey (1965); however, amendments to their lists have been made as a result of the current research. These changes are explained in this section and an up-to-date list of the forest-dependent species is provided (Table 2). It is important to note that some of the additions were species that Moreau (1944) had recorded in the cultivation zone below the forest belt. Indeed, he had stated that some of those species might subsequently be qualified as "montane". In addition, the distinction between non-forest species and forest species is sometimes rather vague (Stuart 1983), thus some forest edge species are included in this new list (Table 2).

Four species are omitted from Mt Kilimanjaro's list of forest avifauna as their initial records were based on misidentifications or misleading information on the exact locality. A further 11 are added to the list, some of which are mainly restricted to the forest edge. Another nine species, most of which were listed by Britton (1980) as occurring on Mt Kilimanjaro, may occur on the foothills of the mountain. Each of these are discussed in their appropriate sections below.

Deletions

Crested Guineafowl *Guttera pucherani*

Johnston (Shelley & Johnston 1886) found this bird in thickets and ravines on the slopes of Mt Kilimanjaro; Kittenberger (1958) noted it from forest along the Rau River, near Moshi, in 1903. Mackworth-Praed and Grant (1957) state that it inhabits

thickets and lightly forested areas but not highland forest. Britton (1980), however, also records it from the mountain but does not indicate that it is confined to forest and thickets on the foothills.

Moreau (1936, 1944), Grossman (pers. comm.) and I have not recorded this bird in the forested parts of Mt Kilimanjaro. It probably occurs in the dense thickets on the foothills but not in highland forest. This statement is supported by Moreau (1936) who states that most records are from eastern parts of the mountain like "Taveta and Kahe". It may be important to note that this species is probably extinct from the Rau Forest, in which it was recorded by Kittenberger (1958) in 1905. The forest was surveyed for six months in 1985 (as well as periodically between 1986–1987) and there was no evidence of its presence. Since this forest has been isolated by human habitation, pressures from encroachment, domestic animals and hunting have probably taken this species' toll. [NB: It still occurs at Kahe II Forest Reserve where a recent survey was done (Cordeiro *et al.* in prep.)].

Green Tinkerbird *Pogoniulus leucomystax*

This taxon was believed to inhabit the forest of Mt Kilimanjaro; however, this turns out to be a misidentification. Lamprey (*in litt.*) had based his identification on Moreau's (1936, 1944) record of the species, having not observed the bird at close range. Moreau had not misidentified the bird: he placed it as *Viridibucco simplex leucomystax*. Interestingly, Oberholser (1905) records this taxon from Mt Kilimanjaro as early as 1888. The taxonomy of the tinkerbirds has since been revised and two species are recognized: Green Tinkerbird *Pogoniulus simplex* and Moustached Green Tinkerbird *P. leucomystax*. Only the latter was recorded on Mt Kilimanjaro.

Orange Ground Thrush *Turdus gurneyi*

Mackworth-Praed & Grant (1960), copied by Lamprey (1965), recorded this bird on Mt Kilimanjaro. Moreau (1936) erroneously recorded this taxon here on the basis of a juvenile specimen which was later determined to be the similar Abyssinian Ground Thrush *T. piaggiae* (Moreau 1966) which does occur on Kilimanjaro.

Taita Thrush *Turdus helleri*

Bednall (1958) reported this bird from cultivation at c. 2000 m on 20 February 1956. It was not observed during 110,305 net-m-h of mist-net sampling and thus the original record is probably a misidentification (H. Grossman *in* Collar & Stuart 1985) or that of a wanderer (Hall & Moreau 1962). It is doubtful that it occurs on Kilimanjaro (Turner *in* Collar & Stuart 1985; pers. obs.).

Additions

[Buff-spotted Pygmy Crake *Sarothrura elegans*]

Benson (*in* King 1973) believed that the Chestnut-tailed Pygmy Crake *S. affinis* could occur on Kilimanjaro as it is known from Mt Kenya and southern Tanzania (Keith *et al.* 1970). At 2400 m, just after it rained at dusk on 12 and 13 November, a bird called

Table 2. Systematic list of all Mt Kilimanjaro species recorded in the field, including altitude ranges on west and south slopes, habitats used and other notes. Note that with further research, the classification of some forest and forest-edge species will most likely change. Altitudinal ranges are accurate for most understorey species and a few canopy dwellers; the ranges given here are based on observations during this study only. A few species are included as records of other observers (Moreau 1944, J. Grimshaw pers. comm. 1993, N. and E. Baker pers. comm. 1993)

Species classification	Status in Africa (Collar & Stuart 1985)		Ecology	
• = forest inhabitants	* = threatened		° = showed evidence of seasonal altitudinal movements	
•• = forest edge inhabitants	** = candidate threatened		+ = occurs above forest in heath zone	
Habitats				
a = alpine zone			fc = forest canopy	
b = bushland below forest			fe = forest edge	
c = cultivation adjacent to forest			fg = forest glades	
df = disturbed forest			fu = forest understorey	
e = heath zone			p = conifer plantations	
f = forest			r = riparian habitats	
Species	altitudinal range (m)		habitats(s) used	comments
	W slopes	S slopes		
Little Grebe				
<i>Tachybaptus ruficollis</i>	2100		pond	at Londorosi
Black-headed Heron				
<i>Ardea melanocephala</i>	2100		pond	at Londorosi
Hamerkop				
<i>Scopus umbretta</i>	2100		pond	at Londorosi
Hadada Ibis				
<i>Bostrychia hagedash</i>	2100		pond	at Londorosi; feeding in conifer plantations and adjacent cultivated areas
Green Ibis				
<i>Bostrychia olivacea</i> • •		2050	f	
African Black Duck				
<i>Anas sparsa</i> •	1700–2100	900–1500	pond; r	frequents most rivers flowing from the mountain and as low as 900 m

continued

Species	altitudinal range (m)		habitats(s)	comments
	W slopes	S slopes	used	
African White-backed Vulture				
<i>Gyps africanus</i>	< 1900		flies over f; c	
Hooded Vulture				
<i>Necrosyrtes monachus</i>	< 1900		flies over f; c	
Harrier Hawk				
<i>Polyboroides radiatus</i>			df	at Kilimanjaro Timbers, 2000 m, (J. Grimshaw pers. comm. 1993)
Bateleur				
<i>Terathopius ecaudatus</i>	< 1900		flies over f; c	
Little Sparrowhawk				
<i>Accipiter minullus</i>	< 2050	< 1600	fe; c; b	seen taking Speckled Mousebird
Rufous Sparrowhawk				
<i>A. rufiventris</i> •	1750	(900) 1500	f; c	
African Goshawk				
<i>A. tachiro</i> •	< 2350	< 2900	f; c; b	
Tawny Eagle				
<i>Aquila rapax</i>	< 2000		flies over f; c	
Wahlberg's Eagle				
<i>A. wahlbergi</i>	< 2000		flies over f; c	
Augur Buzzard				
<i>Buteo augur</i>	< 3000	< 3000	b; fe; e; a	also at Kilimanjaro Timbers, 2000 m, (J. Grimshaw pers. comm. 1993)
Mountain Buzzard				
<i>B. oreophilus</i> •	1750–2600	1500–2900+ f		
African Hawk Eagle				
<i>Hieraaetus spilogaster</i>	1700		flies over f; c	
Long-crested Eagle				
<i>Lophaetus occipitalis</i> ••	< 2600		fe; df	also at Kilimanjaro, Timbers, 2000 m, (J. Grimshaw pers. comm. 1993)
Crowned Eagle				
<i>Stephanoaetus coronatus</i> •	1650–2600	1500–2500 f		
Cuckoo Hawk				
<i>Aviceda cuculoides</i> ••	1750		fe	2 records: 8, 11 December
Black-shouldered Kite				
<i>Elanus caeruleus</i>	< 2200	< 2200	flies over c	
Lanner Falcon				
<i>Falco biarmicus</i>	2100		fe; cp	possibly resident at Londorosi

Species	altitudinal range (m)		habitats(s) used	comments
	W slopes	S slopes		
Peregrine Falcon <i>F. peregrinus</i>			df	at Kilimanjaro Timbers, 2000 m, (J. Grimshaw pers. comm. 1993)
Scaly Francolin <i>Francolinus squamatus</i> •	1700–2550+	1550–2900+	fe; fg; f; e	present in lower heath zone
[<i>Sarothrura elegans</i>] •		2400	f	see notes on “Addi- tions”, p. 74
Black-winged Stilt <i>Himantopus himantopus</i>	2100		pond	at Londorosi
Lemon Dove <i>Aplopelia larvata</i> • °	1700–2500	1600–2050	fu	
Olive Pigeon <i>Columba arquatrix</i> •	1700–2500	1500–2900	fc	
Bronze-naped Pigeon <i>C. delegorguei</i> •	1700–2350	1500–2050	fc	not common
Speckled Pigeon <i>C. guinea</i>	< 2000		flies over f	also at Kilimanjaro Timbers, 2000 m, (J. Grimshaw pers. comm. 1993)
Dusky Turtle Dove <i>Streptopelia lugens</i>	1700–1900		fe; c	seen next to forest near Nduimet
Red-eyed Doves <i>S. semitorquata</i>	< 2300	< 1400	fe; c	feeds in small flocks (3–6)
Tambourine Dove <i>Turtur tympanistria</i> •	1700–1900	1600–1900	c; fu	
Green Pigeon <i>Treron calva</i> ••	< 2200	< 1600	fe; df	also at Kilimanjaro Timbers, 2000 m, (J. Grimshaw pers. comm. 1993)
Red-fronted Parrot <i>Poicephalus gulielmi</i> •	2050–2550	1600–2200	fc	
Hartlaub's Turaco <i>Tauraco hartlaubi</i> •	1700–2400	1500–2500	f	highest densities <1900 m (W slope) possibly due to downward seasonal migration due to fruiting trees (<i>Teclea</i> sp., <i>Euclea</i> sp., <i>Ilex</i> sp., <i>Olea</i> sp.).

Species	altitudinal range (m)		habitats(s) used	comments
W slopes	S slopes			
Emerald Cuckoo <i>Chrysococcyx cupreus</i>	1750		fe	possibly overlooked on south slope
Klaas' Cuckoo <i>C. klaas</i>	< 2500	< 1600	fe	
Red-chested Cuckoo <i>Cuculus poliocephalus</i>	< 2350	< 1600	fe; df	also at Kilimanjaro Timbers, 2000 m, Nov-Dec 1993; (J. Grimshaw pers. comm. 1993)
Yellowbill <i>Ceuthmochares aereus</i>		1600	c	Simba Farm, 7 Sep 1990, (J. Grimshaw pers. comm. 1993)
White-browed Coucal <i>Centropus superciliosus</i>	< 1750	< 1750	c; b; fe	scarce at forest edge; at Kilimanjaro Timbers, 2000 m, (J. Grimshaw pers. comm. 1993)
Verreaux's Eagle Owl <i>Bubo lacteus</i>	< 1600	< 1500	fe; c; b	
African Wood Owl <i>Strix woodfordii</i> •	1700–2500	1500–2900	f	
Montane Nightjar <i>Caprimulgus poliocephalus</i>	1900		fe; b	
Alpine Swift <i>Apus melba</i>	> 1700	> 1500	flies over f; e; a	
Nyanza Swift <i>A. niansae</i>	< 2500		flies over f; e	
Scarce Swift <i>Schoutedenapus myoptilus</i>	> 1700		flies over f	
Speckled Mousebird <i>Colius striatus</i>	up to 2400		df; c	also at Kilimanjaro Timbers, 2000 m, (J. Grimshaw pers. comm. 1993)
Bar-tailed Trogon <i>Apaloderma vittatum</i> •	1700–2500	1500–2900	f	
Giant Kingfisher <i>Ceryle maxima</i> •		up to 1500	r	may extend higher on some rivers; fed on freshwater crabs

Species	altitudinal range (m)		habitats(s) used	comments
	W slopes	S slopes		
Brown-hooded Kingfisher <i>Halcyon albiventris</i>		< 1500	r; c	
Eurasian Bee-Eater <i>Merops apiaster</i>	up to 2600		over b; f	migrating southwards and first flocks seen in late September; rested in forest canopy; at Kilimanjaro Timbers, 2000 m, Nov 1992 (J. Grimshaw pers. comm. 1993)
Northern Carmine Bee-eater <i>M. nubicus</i>	< 1900		b	one record on 1 Sep
Cinnamon-chested Bee-eater <i>M. oreobates</i> •	1700–2500	1500–1600	fc; fe	
Broad-billed Roller <i>Eurystomus glaucurus</i> ••	2200		fe	only one record: 21 Dec
Green Wood Hoopoe <i>Phoeniculus purpureus</i>	1900		fe	only one record: 5 Sep
Silvery-cheeked Hornbill <i>Bycanistes brevis</i> •	1700–2500	1500–1750	f; fe	frequents thin or disturbed forest
White-eared Barbet <i>Stactolaema leucotis</i> ••	1700–1900	1400–1550	fe; c	present in thin forest
Brown-breasted Barbet <i>Lybius melanopterus</i>		< 1500	c	
Moustached Green Tinkerbird • <i>Pogoniulus leucomystax</i>	1700–2500	1500–2350	f	not common in <i>Podocarpus–Erica</i> forest on south slope
Scaly-throated Honeyguide <i>Indicator variegatus</i>	1700–1900		f; fe	
Cardinal Woodpecker <i>Dendropicos fuscescens</i>				noted from forest by Moreau (1944)
Olive Woodpecker <i>D. griseocephalus</i> •	1700–2500	1600–2500	f	not recorded in <i>Podocarpus–Erica</i> forest on south slope
House Martin <i>Delichon urbica</i>	< 2300		over f; c	late October and December

continued

Species	altitudinal range (m)		habitats(s) used	comments
	W slopes	S slopes		
Eurasian Swallow <i>Hirundo rustica</i>		2900	over f; e	late September and October
Mosque Swallow <i>H. senegalensis</i>			fg; df	at Kilimanjaro Timbers, 2000 m (J. Grimshaw pers. comm. 1993)
Black Rough-wing <i>Psolidoprocne pristoptera</i>	1700–2500+	1400–2650 f		
Banded Martin <i>Riparia cincta</i>	2300		c; b	
Drongo <i>Dicrurus adsimilis</i>	< 1400		b; c	
Black-headed Oriole <i>Oriolus larvatus</i>	1900		fe	one record: 4 September
White-necked Raven <i>Corvus albicollis</i>		> 2900	e; a	
Pied Crow <i>C. albus</i>	2100	1450	nr village	at Londorosi and Mweka
African Hill Babbler <i>Alcippe abyssinica</i> • °	1700–2500	1600–1900 f		
Grey Cuckoo Shrike <i>Coracina caesia</i> •	2050–2200		f; fg; fe	
Striped-cheeked Greenbul • ° <i>Andropadus milanjensis</i>	1700–2050	1600–1750 f		
Mountain Greenbul <i>A. tephrolaemus</i> • °	1650–2500	1600–2900 f		
Nicator <i>Nicator chloris</i> •			f	dense forest on north slope (2150 m)
Olive Mountain Greenbul • <i>Phyllastrephus placidus</i>	1700–2500	1600–2500 fu; fe		
Common Bulbul <i>Pycnonotus barbatus</i>	< 2200		c; fe	also at Kilimanjaro Timbers, 2000 m, (J. Grimshaw pers. comm. 1993)
Robin Chat <i>Cossypha caffra</i> ••	1600–2500+	1500; 2900+	fe; e	
Rüppell's Robin Chat <i>C. semirufa</i> •	1700–2500	1600–2050 fu; fe		
White-starred Forest Robin • ° <i>Pogonocichla stellata</i>	1700–2500	1600–2900+	f; fe	

Species	altitudinal range (m)		habitats(s) used	comments
	W slopes	S slopes		
Stonechat <i>Saxicola torquata</i>	1800–2600+		c; b; e	also at Kilimanjaro Timbers, 2000 m, (J. Grimshaw pers. comm. 1993)
Northern Olive Thrush <i>Turdus abyssinicus</i> • °	1900–2500	1500–1900	f; fe; p	
Abyssinian Ground Thrush <i>T. piaggiae</i> •	2500	2050–2900	fu	
Black-headed Apalis <i>Apalis melanocephala</i> •	1750–2350	1500–1900	f	
Bar-throated Apalis <i>A. thoracica</i> • °	1700–2500	1600–2650	fu; fe; fg	
Evergreen Forest Warbler • ° <i>Bradypterus barratti</i>	1700–2350	1600–2650	fu; fe; fg	
Cinnamon Bracken Warbler <i>B. cinnamomeus</i> • •	1750–2500+	2800+	fe; fg; c	
Grey-backed Camaroptera • <i>Camaroptera brachyura</i>	< 2200		fe; fg; c	
Yellow Warbler <i>Chloropeta natalensis</i>	1900		b	Britton (1980) states that this warbler and <i>C. similis</i> are segregated by altitude; however, it is also possible that they occupy different habitats. Both species occurred at 1900 m but only <i>C. similis</i> was netted in forest
Mountain Yellow Warbler <i>C. similis</i> •	1900–2500+	1900–2400	fg; df; fe	
Hunter's Cisticola <i>Cisticola hunteri</i>	> 2100	> 2900	fe; df; e	
Winding Cisticola <i>C. galactotes</i>	< 1900		c; b	
River Warbler <i>Locustella fluviatilis</i>			c	Rombo Mkuu, Dec 1986 (N.E. & E. M. Baker pers. comm. 1993)
Willow Warbler <i>Phylloscopus trochilus</i>		1550	fe	late Oct–Nov
Brown Woodland Warbler • <i>P. umbrovirens</i>	1900–2500	1600–2900+	f; e	

continued

Species	altitudinal range (m)		habitats(s) used	comments
	W slopes	S slopes		
Tawny-flanked Prinia				
<i>Prinia subflava</i>	< 1900		c; b	
Garden Warbler				
<i>Sylvia borin</i>		1550	fe	late Oct–Nov
Blackcap				
<i>S. atricapilla</i>		1500–1750	fe; f	in mixed flock; late Oct–Nov
White-eyed Slaty Flycatcher ••				
<i>Melaenornis chocolatina</i>	1750–2500		fe; fg	attended ant swarm
Dusky Flycatcher				
<i>Muscicapa adusta</i> •	1700–2500+	1500–2900+	f; fe	
Forest Batis				
<i>Batis mixta</i> • °	1700–2300	1600–2050	f	
Chin-spot Batis				
<i>Batis molitor</i>	1750–2000		b; df	party of 5 seen in disturbed forest at Kilimanjaro Timbers in June 1990; pair hunting in grassy area on west slope
Paradise Flycatcher				
<i>Terpsiphone viridis</i> •	< 2350	1600–2350	fe; c; f	
Crested Flycatcher				
<i>Trochocercus cyanomelas</i> •	1600–1900		f	
African Pied Wagtail				
<i>Motacilla aguimp</i>	2100	1450	c	near villages
Mountain Wagtail				
<i>Motacilla clara</i>	1900–2350	1500	r	
Yellow Wagtail				
<i>Motacilla flava</i>	2250		c	race not determined
Black-backed Puffback				
<i>Dryoscopus cubla</i> ••	1700–1900	< 1500	fe, fg	
Tropical Boubou				
<i>Laniarius ferrugineus</i> ••	1700–2500+	1600	fe; fg; c; e	attended ant swarms; very common at 1600–1900 m on west slope
Many-coloured Bush Shrike •				
<i>Malaconotus multicolor</i>	1700–2200	1500–1950	f	
Fiscal				
<i>Lanius collaris</i>	2300		c; b	also at Kilimanjaro Timbers, 2000 m, (J. Grimshaw pers. comm. 1993)
Abbott's Starling				
<i>Cinnyricinclus femoralis</i> •• •	2300–2500	2200	fc	

Species	altitudinal range (m)		habitats(s) used	comments
	W slopes	S slopes		
Sharpe's Starling <i>C. sharpii</i> •	2500	2200	fc	
Red-winged Starling <i>Onychognathus morio</i>	< 1900	< 1500	c; b	
Waller's Chestnut-winged Starling • <i>O. walleri</i>	1750–2500	1600–2900	fc	
Kenrick's Starling <i>Poeyoptera kenricki</i> ** •	2350–2500	1900–2200	fc	
Collared Sunbird <i>Anthreptes collaris</i>	1700–1800	1500	fe; c	
Amethyst Sunbird <i>Nectarinia amethystina</i>		< 1500	c	
Malachite Sunbird <i>N. famosa</i>	2100		at pond	at Londorosi; feeding at <i>Crotolaria</i> sp.
Scarlet-tufted Malachite Sunbird <i>N. johnstoni</i>	> 2600	> 2900	e	one seen at Londorosi pond (2100 m); fed at <i>Lobelia</i> sp., <i>Hypericum</i> sp. and <i>Protea</i> sp.
Bronze Sunbird <i>N. kilimensis</i>		< 1500	c	
Eastern Double-collared Sunbird • ° <i>N. mediocris</i>	1750–2500+	2200–2900+	f; fe; fg; e	obtained nectar from two <i>Impatiens</i> spp.
Olive Sunbird <i>N. olivacea</i> • °	1750–2350	1600–2500	f	
Golden-winged Sunbird <i>N. reichenowi</i>	1600–2400	1500	fe, fg; b	fed at <i>Crotolaria</i> spp. and <i>Leonotis</i> spp. which dominated disturbed forest on west slope
Tacazze Sunbird <i>N. tacazze</i>	2200	1500	fe	
Variable Sunbird <i>N. venusta</i>	< 1500	< 1500	fe; c; b	at Kilimanjaro Timbers, 2000 m (J. Grimshaw pers. comm. 1993)
Montane White-eye <i>Zosterops poliogastra</i> •	1700–2500+	1600–2900+	f; fg; fe; e; df	

continued

Species	altitudinal range (m)		habitats(s) used	comments
	W slopes	S slopes		
Red-naped Widowbird <i>Euplectes ardens</i>	1700–1900		b	Large flock of 20–40 females with 3–5 males; foraged in bare patches of scrubby and tall grassy area.
Baglafecht Weaver <i>Ploceus baglafecht</i>	< 2600	< 1550	fe; c;	
Spectacled Weaver <i>Ploceus ocularis</i> ••	1600–2200	< 1500	fe; c	fed in association with greenbuls, thrushes and warblers
Cardinal Quelea <i>Quelea cardinalis</i>			df; b	at Kilimanjaro Timbers, 2000 m (J. Grimshaw pers. comm. 1993)
Rufous Sparrow <i>Passer motitensis</i>	1500–2100		b; c	
Pin-tailed Whydah <i>Vidua macroura</i>		< 1450	c	
Red-faced Crimson-wing •• <i>Cryptospiza reichenovii</i>	1750		fe	
Abyssinian Crimsonwing <i>C. salvadorii</i> •	1700–2500	1600–2900	fu; fe	
Waxbill <i>Estrilda astrild</i>	< 1600		c; b	at Kilimanjaro Timbers, 2000 m (J. Grimshaw pers. comm. 1993)
Yellow-bellied Waxbill <i>Estrilda melanotis</i> ••	1600–2350	1400–1550	fe; c	
Grey-headed Negrofinch • <i>Nigrita canicapilla</i>	1900–2500	1900–2350	fe; fg; f	
Black and White Mannikin <i>Lonchura bicolor</i> ••	< 2350	< 1550	fe; c	ssp. <i>nigriceps</i>
Golden-breasted Bunting <i>Emberiza flaviventris</i>		< 1450	c	
Oriole Finch <i>Linurgus olivaceus</i> •	2500	1900–2350	fu; fg	
Thick-billed Seed-eater <i>Serinus burtoni</i> •	1750	2400	f	ssp. <i>kilimensis</i>

Species	altitudinal range (m)		habitats(s) used	comments
	W slopes	S slopes		
Yellow-crowned Canary <i>S. canicollis</i>	2200; 2500+ 1500; 2900+ c; b; e			also at Kilimanjaro Timbers, 2000 m (J. Grimshaw pers. comm. 1993)
African Citril <i>S. citrinelloides</i>	1700–2300 < 1600		c; b	
Streaky Seed-eater <i>S. striolatus</i> ••	1800–2600+ > 2900		c; fe; e	
Brimstone Canary <i>S. sulphuratus</i>	< 1900	c; b		

for several minutes sounding like a peculiar horn. The call resembled that of *S. elegans* but more conclusive evidence is necessary before acceptance of this record.

Rufous Sparrowhawk *Accipiter rufiventris*

Two individuals of this uncommon raptor were observed just inside the forest on both south and west slopes. Several observations were also made of a brown goshawk with a longish tail, unlike that of the other forest dweller, the African Goshawk. However, the raptor could not be sufficiently identified due to its rapid movements through the forest canopy. It is strange that early investigations have missed this bird and that the only other documentation is that of Williams (1967).

African Goshawk *Accipiter tachiro*

This raptor occurred throughout the forest, especially from lower to mid-altitudes, and yet it was not mentioned by either Moreau (1936, 1944), Moreau & Moreau (1939) or Lamprey (1965).

Mountain Buzzard *Buteo oreophilus*

This raptor was considered an alpine inhabitant by Moreau (1944); however, it is definitely a forest dweller which infrequently visited the heath zone of the mountain. King (1973) also noted it to be a forest dweller.

Scaly-throated Honeyguide *Indicator variegatus*

Not previously reported from Kilimanjaro by Moreau (1936, 1944) or Lamprey (1965). It was observed in forest on the west slope.

Black-headed Apalis *Apalis melanocephala*

A canopy inhabitant on Kilimanjaro, this species eluded earlier naturalists; van Someren being the first to discover it and assign the Kilimanjaro population as the

subspecies *moschi* (van Someren 1931). Moreau (1944) strangely excluded this *apalis* from his list of forest birds although he included it as a bird of intermediate forest in an earlier paper (Moreau 1936). Britton (1980) notes it from Kilimanjaro. It occurs on both slopes of the mountain.

Grey-backed Camaroptera *Camaroptera brachyura*

Not strictly a forest dweller on the densely forested south slopes, this bird penetrated the forest interior on the west slope. Moreau (1936) classified it as a bird of the cultivation zone and later noted it near the forest boundary on the north slope (Moreau & Moreau 1939). However, this species was abundant in low-altitude forest that was thin and yet contained a dense understorey.

Crested Flycatcher *Trochocercus cyanomelas*

Moreau (1944) and Lamprey (1965) do not include this species in their list of forest birds; however, Moreau (1936) had noted it from fringing forest in Machame from 1200–1500 m. W. L. Abbott had previously collected it from 1850 m (Oberholser 1905) and Sjöstedt (1910) had also collected it from the forest. Britton (1980) rightly records it from the foothills of Kilimanjaro where it inhabits the lower forests on the south and southwestern slope (see Ecology section, p. 92).

Paradise Flycatcher *Terpsiphone viridis*

Although Britton (1980) records this species from Mt Kilimanjaro, Moreau (1936) believes it to be a flycatcher of the forest edge, vestigial forest and bush, occurring below the forest belt. This species penetrated the forest interior and has been recorded up to 2350 m on both aspects (Table 2); it is also common in disturbed forest up to 2000 m at Kilimanjaro Timbers (J. Grimshaw pers. comm. 1993).

Nicator *Nicator chloris*

Britton (1980) records this species from Mt Kilimanjaro, probably copying Sjöstedt's (1910) and Moreau's (1936) records. Sjöstedt (1910) reported it from the cultivated zone where he noted it as scarce. Moreau (1936) also noted it from scrub at Marangu at 1850 m. A pair were observed in dense forest on the north slope in June 1990.

Sharpe's Starling *Cinnyricinclus sharpii*

Britton (1980) records this starling from Mt Kilimanjaro; however, this species was not mentioned by either Moreau (1936, 1944), Moreau & Moreau (1939), or Lamprey (1965). At least three sightings of this bird were made on both slopes.

Red-faced Crimson-wing *Cryptospiza reichenovii*

Moreau (1936) commented on the absence of this estrildid on Mt Kilimanjaro. A single observation of a pair at the forest edge on the west slope suggests that this species is scarce and has probably been overlooked.

Species occurring below the forest belt

The following have been recorded on "Kilimanjaro", a location used broadly during the 1800s and early 1900s to denote the area in the vicinity of this mountain. Thus for many of these species (Table 2), the riparian habitats and groundwater forest patches on the foothills of Kilimanjaro are more likely localities. This is confirmed for most species except the Dark-backed Weaver *Ploceus bicolor*. For some species, further investigations might indicate their presence at higher altitudes.

Narina's Trogon *Apaloderma narina*

Mackworth-Praed and Grant (1957) and Williams (1967) record this trogon from Mt Kilimanjaro, but Moreau (1936, 1944), Moreau & Moreau (1939), and Lamprey (1965) do not mention it. Johnston (Shelley & Johnston 1886) apparently shot one at 900 m and Sjöstedt (1910) obtained a specimen from the cultivation zone at Kibongoto.

It has probably been overlooked due to its inconspicuous nature. The closely related Bar-tailed Trogon *A. vittatum* occurs from 1600–2900 m on Mt Kilimanjaro (Table 2), and since in many localities the two birds are separated altitudinally (Narina's mostly at lower altitudes: Britton 1980, Benson 1982, Stuart 1983), it is possible that Narina's occurs in riverine forest below 1600 m. A single observation of a trogon along the Weru Weru river (c. 1000 m) in the mid-1980s (pers. obs.) could have been this species but the identification was not certain.

Cardinal Woodpecker *Dendropicos fuscescens*

This woodpecker was noted from the forest by Moreau (1944); however, its occurrence is probably limited to the forest at the lowest altitudes and forested and wooded habitats below the main forest belt.

Little Greenbul *Andropadus virens*

This species has been recorded from Marangu (van Someren 1932) and Kibosho (Kittenberger 1959) but was not recorded in this study. It may inhabit the lower forest near rivers and was recently netted at Kahe II Forest Reserve (Cordeiro *et al.* in prep.).

Dark-backed Weaver *Ploceus bicolor*

Williams (1967) is the only person who recorded this weaver from Mt Kilimanjaro. Moreau (1948) notes that unlike some forests in Kenya and eastern Tanzania, Mt Kilimanjaro lacks a forest weaver. As the species also inhabits dense woodland (Britton 1980; N. & E. Baker, pers. comm.), it is possible that the record in Williams (1967) is from the wooded slopes of the mountain.

African Broadbill *Smithornis capensis*

This understorey dweller apparently occurs on Mt Kilimanjaro (Britton 1980). Britton (1980) may have obtained this reference from Kittenberger (1959) who noted it from forest along the Rau River, near Moshi. It was not noted from montane forest and may be under-recorded due to its inconspicuous nature (Dowsett-Lemaire 1989).

Other species

Various authors have noted the following from cultivated fields, riverine forest, thickets and foothill forest patches (Sjöstedt 1910, van Someren 1932, Kittenberger 1959, Britton 1980): Kretschmer's Longbill *Macrosphenus kretschmeri*, Yellow-bellied Greenbul *Chlorocichla flaviventris*, Grey-olive Greenbul *Phyllastrephus cerviniventris* and Green-backed Twinspot *Mandingoa nitidula*.

Ecology and distribution of forest species

In this section, most forest-dependent species recorded on Mt Kilimanjaro during this study are discussed. These include some species of the forest edge. The behaviour, feeding niche and habitat preference are described in detail for many species; especially the understorey birds which were the most intensively studied. A summary of habitats, altitude ranges and other notes is presented for all species recorded in the field (Table 2).

Threskiornithidae

The Green Ibis *Bostrychia olivacea* was only observed on the south slope in dense and little-disturbed forest. Three individuals were briefly observed feeding in the early morning (6 November) on the ground some 20 m away from a fallen tree. That evening at least two were flushed from the undergrowth and, at dusk, three birds roosted in a huge *Ocotea* tree about 150 m from the fallen tree. Brown *et al.* (1982) mention that this ibis "prefers to roost in giant trees with dead tops". The ibises roosted in the foliage of a very mature tree which lacked a dead canopy. At dawn of the following morning, three birds were again flushed from the understorey in the same locale as the previous day.

Accipitridae

Crowned Eagles *Stephanoaetus coronatus* were seen hunting in pairs, probably searching for troops of Colobus and Blue monkeys (*Colobus polykomos* and *Cerco-pithecus mitis*). Both primates hid in the understorey and alarm-called when they detected the eagles (Cordeiro 1992). The distribution of this eagle on both aspects may be related to the presence of Blue Monkeys and Colobus Monkeys: it was recorded at the uppermost levels of the forest on the west slope where both primates were present and was recorded from 1500–2500 m (south slope) which corresponded to the limits of Colobus Monkeys.

Accipiter tachiro occurred throughout the forest. It was often caught in mist nets where it attacked netted birds: one killed a White-starred Forest Robin *Pogonocichla stellata* and another chased a Scaly-throated Honeyguide *Indicator variegatus* into a net. Netted birds often give alarm calls attracting goshawks to the vicinity of mist-nets.

Phasianidae

The Scaly Francolin *Francolinus squamatus* occurred in the undergrowth and

frequented glades, streams and dense forest stands. It leaves its sign by digging at elephant dung until flattened and probably consumes the undigested seeds and insects.

Columbidae

The Dusky Turtle Dove *Streptopelia lugens* seemed somewhat dependent on the forest edge and the adjacent cultivated fields. It foraged in small flocks (2–8) on the burnt slope close to the forest and roosted in trees at the forest edge and sought refuge there when disturbed.

Lemon Doves *Aplopelia larvata* fed alone or in pairs on the ground for invertebrates and fallen fruits and seeds. At 2050 m (western aspect), five individuals roosted close to each other in a tree and shrubs (*Senecio* sp. and *Piper capense*) at understorey level.

Psittacidae

Red-fronted Parrots *Poicephalus gularis* showed regular daily movements from one part of forest to another. Every morning, flocks ranging from over two to 20 birds would fly southwards from the direction of Ol Molog towards Sanya Juu, returning in the evening. A few flocks would also fly in the opposite direction. On the south slope, fewer birds in smaller flocks (2–10 birds) were seen. These birds flew westwards in the morning and in the opposite direction at dusk. In Kenya, these parrots are known to fly daily from the Cherangani Hills to Mt Elgon (60 km), leaving the hills at dawn and returning at dusk (Fry *et al.* 1988). In the evenings, large flocks fed on ripe fruits of *Podocarpus* trees at the ecotone between the Ericaceous zone and the forest on the west slope.

Strigidae

Two adult African Wood Owls *Strix woodfordii* were attracted to a camp-fire at 2050 m along the Mweka route: they kept calling and came closer and closer to inspect the scene. Kittenberger (1959) made similar observations for the Verreaux's Eagle Owl *Bubo lacteus* below the forest.

Trogonidae

The Bar-tailed Trogon *Apaloderma vittatum* was regularly encountered throughout the altitudinal expanse of forest on both slopes. It snatched prey on the wing and from bark.

Timaliidae

The African Hill Babbler *Alcippe abyssinica* fed mainly in the understorey and occasionally in the mid-stratum. It gleaned insects by searching the leaves and branches of shrubs and small trees and was common in dense understorey; it also ate small fruits.

Campephagidae

The Grey Cuckoo Shrike *Coracina caesia* is very shy and inconspicuous unless it calls

or flies after prey. It fed in the mid-stratum and canopy by gleaning insects off leaves and branches of trees. It sometimes caught insects in flight, as was observed when feeding in association with the Forest Batis *Batis mixta* and Black-headed Apalis *Apalis melanocephala*.

Pycnonotidae

Mountain Greenbul *Andropadus tephrolaemus* and Striped-cheeked Greenbul *A. milanjensis* fed in the understorey and occasionally visited the mid-stratum and canopy where they took insects and fruit. On the west slope both were observed consuming *Teclea* and *Euclea* fruits and on the south slope, fruits of the Rubiaceae family were favoured. The densities of *A. milanjensis* were highest at low altitudes where those of *A. tephrolaemus* were much lower: *A. tephrolaemus* dominated above 1900 m. This pattern is indicative of competition which is also believed to affect these species in the Usambaras (Stuart 1983).

Olive Mountain Greenbul *Phyllastrephus placidus* gleaned insects from shrubs and small trees and searched for food in the ground foliage. It often attended ant swarms, sometimes in association with *A. milanjensis*. Mackworth-Praed & Grant (1960) mention that *P. placidus* hunts alone or in pairs; however, on Kilimanjaro it was found in small parties, ranging from two to six individuals.

Turdidae

Robin Chat *Cossypha caffra* fed in a similar manner as below. When both chats occurred at similar altitudes, as on the west slope, it was rare to find both in the same locale: *C. semirufa* penetrated deeper into the forest than *C. caffra*.

Rüppell's Robin Chat *C. semirufa* was very abundant on the west slope where it inhabited the understorey at the forest edge and interior, being less common in very disturbed forest. Although present on the south slope in relatively smaller numbers, it does not seem to prefer the high altitude *Podocarpus*–*Erica* forest. It fed on or near the ground where it gleaned insects from the ground or herbal and shrub layers. This chat snatched invertebrates as it hopped on the ground or as it occasionally overturned leaves; it frequented swarms of ants.

White-starred Forest Robin *Pogonochila stellata* was one of the most numerous of all understorey birds on Kilimanjaro. It foraged mainly in the understorey but sometimes fed in the mid-stratum and canopy. It caught insects in flight through short swoops; gleaned off branches, leaves and tree trunks; and hopped on the ground searching for prey; it was common at ant swarms. Although abundant in undisturbed forest with a very dense understorey, it infrequently foraged at the edge of conifer plantations. Evidence of seasonal movements is provided elsewhere (Cordeiro in prep.).

Northern Olive Thrush *Turdus abyssinicus*: Britton (1980) states that this thrush inhabits the forest edge and glades; on Kilimanjaro, it occurred in the forest interior, forest edge and occasionally hunted in cypress plantations. It usually foraged on the ground and in the understorey where it picked fruits or insects; it also searched for

insects and fruits at all levels of the forest. It climbed the trunks and branches of trees probing its beak into moss, lichen, clefts or bark for invertebrates. In conifer plantations *T. abyssinicus* foraged for insects by turning over the fallen needles. On occasion, it was observed feeding in mixed flocks with greenbuls.

Abyssinian Ground Thrush *T. piaggiae* occurred at high altitudes especially where the forest floor is densely covered with mosses and lichens (Grossman pers. comm.). It probed its beak in clumps of moss and lichens, both on the ground and in the herbal and shrub layers; invertebrates were searched for in topsoil.

Sylviidae

Bar-throated Apalis *Apalis thoracica* and Black-headed Apalis *A. melanocephala* separate vertically: *A. thoracica* occupied the mid-stratum to canopy level and *A. melanocephala* the understorey. *A. melanocephala* often associated with mixed flocks; it gleaned invertebrates from bark and branches, as well as clumps of leaves. When prey species attempted to escape it pursued and captured them in short flights. Both warblers usually hunted alone or in pairs and fed in a similar manner. *A. thoracica* was found mainly at the forest edge, although it penetrated thin forest where it fed mainly in the understorey layer, seldom being found in the mid-stratum. On the south slope, *A. thoracica* was rarely encountered in the interior of dense forest but was seen foraging near glades; it was very common on the western gradient.

Evergreen Forest Warbler *Bradypterus barratti* and Cinnamon Bracken Warbler *B. cinnamomeus* foraged on the ground or in the herbal layer where they gleaned invertebrates from foliage, the base of tree trunks or the ground. Both were infrequently observed at ant swarms. *B. barratti* occurred at the forest edge and interior, being scarce in thin and shrubby forest where its congener, *B. cinnamomeus*, often took its place. Both species occurred sympatrically at varying altitudes so long as a forest edge or glade was present; *B. barratti* preferred very dense understorey and *B. cinnamomeus* scrubby areas with bracken. In the heath zone, only *B. cinnamomeus* was observed although *B. barratti* might have been present in small numbers, especially nearer the forest. At high altitudes where the dominant herbal layer consists of grasses (*Diplachne* sp.), *B. cinnamomeus* was very common and *B. barratti* rare.

Grey-backed Camaroptera *Camaroptera brachyura* was only observed on the west slope where it was a common resident of the understorey at low altitudes. Its apparent absence at low altitudes on the south slope is difficult to understand especially since it occurs in the coffee and banana plantations below the forest belt. It may be restricted to drier forests, thus explaining its absence from the wetter south slope. It fed like *B. barratti* but sometimes foraged up to 2–3 m high.

Mountain Yellow Warbler *Chloropeta similis* inhabited forest glades and edges with scrubby vegetation containing clumps of bracken: therefore it was abundant on the western gradient and uncommon in intact forest on the south slope. It gleaned invertebrates from the foliage, branches and sometimes sallied for prey.

Hunter's Cisticola *Cisticola hunteri* inhabited the forest edge and scrubby forest glades on the west slope (not below 2200 m) and was common in the heath zone. It was especially common in impoverished forest above Scota.

Brown Woodland Warbler *Phylloscopus umbrovirens* foraged anywhere from ground-level to the canopy; prey was caught in the air or gleaned from foliage or branches. It fed singly, in pairs or associated with mixed flocks consisting of white-eyes and flycatchers. Although present in some numbers on the western aspect, its abundance on the southern gradient suggests a preference for wet forest or more intact forest habitats.

Muscicapidae

Crested Flycatcher *Trochocercus cyanomelas* and Paradise Flycatcher *Terpsiphone viridis*: *T. cyanomelas* is confined to low altitude wet forest on the south slope, inhabiting the understorey and occasionally foraging in the mid-stratum. *T. viridis* frequented the forest edge on the west slope and seldom penetrated the forest interior: on the south slope it occurred up to the *Podocarpus-Erica* forest, especially where the canopy was thin or broken. *T. viridis* fed at all levels, but was commonly observed in the mid-stratum and canopy; it sometimes joined mixed flocks consisting of warblers, greenbuls, white-eyes and flycatchers.

Forest Batis *Batis mixta* foraged at all levels of the forest but mostly below the mid-stratum. One observation was made of a pair feeding in the canopy with one *Coracina caesia* and two *Apalis melanocephala*.

Dusky Flycatcher *Muscicapa adusta* fed alone, hunting from a perch, and rarely associated with mixed flocks. It usually foraged in the canopy and mid-stratum, and occasionally the understorey; attended ant swarms where it dived for insects that were flushed by the ants.

Malaconotidae

Black-backed Puffback *Dryoscopus cubla* fed in the canopy but occasionally descended to the ground when in pursuit of falling prey. It occurred on the west slope below 1800 m and appeared absent on the south slope. This is strange as it occurred in gardens and coffee plantations below the forest belt on the south slope during the study period. It seems possible that it leaves the southern forest during the cold season or that it may not inhabit the forest at all, specifically not wet forest. Britton (1980) notes that *D. cubla* occasionally occurs inside forest, its prime habitat being forest edges, gardens and woodland. On the west slope, it was found in rather scrubby forest whereas the forest on the south slope is more intact. Hence, habitat preference or climate may be the key factors to this bird's distribution pattern on the mountain.

Many-coloured Bush Shrike *Malaconotus multicolor* fed as above, although it also hopped from branch to branch in the canopy and mid-stratum, snatching prey along its path. It explored the foliage intensively, searching for prey in all directions.

Sturnidae

Abbott's Starling *Cinnyricinclus femoralis* and Sharpe's Starling *C. sharpii* were infrequently seen on both slopes and are probably rare on Kilimanjaro. Small mixed flocks of these birds (up to five individuals) were observed inside forest on the west

slope above 2300 m, and single-species flocks were seen on the south slope. It is interesting that one or two individuals of *C. sharpii* were seen with small flocks of *C. femoralis*; the opposite of which was documented in Arusha National Park (Beesley 1972). Both are canopy species; however, one *C. femoralis* was seen taking prey on the ground with a party of *Turdus abyssinicus*.

Kenrick's Starling *Poeoptera kenricki* and Waller's Chestnut-winged Starling *Onychognathus walleri* are canopy species which often occurred in mixed flocks. *O. walleri* is the most abundant forest starling on Kilimanjaro.

Nectariniidae

Eastern Double-collared Sunbird *Nectarinia mediocris* and Olive Sunbird *N. olivacea*: *N. mediocris* inhabited the full altitudinal expanse of forest (and the heath zone), being rather dominant in thinner and disturbed forest, and forest at high altitudes, where it appeared to replace *N. olivacea*. Where both species occurred, *N. mediocris* was more a bird of the forest edge or glades in more intact forest. *N. olivacea* was very abundant on the south slope and common on the west slope; this may be a reflection of the habitat differences between the two aspects.

Zosteropidae

The Montane White-eye *Zosterops poliogastra* inhabited the full altitudinal expanse of forest as well as the lower heath zone. It was extremely common and was often in mixed flocks; density was highest in dense undergrowth and canopy. These birds fed in small flocks at all levels of the forest where they gleaned invertebrates from foliage. They probed clumps of leaves, twigs, moss and bark for prey. Since the behaviour of one may disturb potential prey, another member of the flock below the disturbance will often benefit when prey drops or tries to escape. Thus they may take insects and spiders in short, quick flights or by fly-catching.

Ploceidae

Forest weavers have not been recorded on Kilimanjaro, unlike other adjacent mountains. The Baglaffeht Weaver *Ploceus baglaffeht* and Spectacled Weaver *P. ocularis* frequented various forest habitats at lower altitudes but are not confined to forest. *P. baglaffeht* penetrated up to about 50 m inside intact forest and up to 300 m inside disturbed forest where glades abound (west slope); it occurred at 2400 m in bracken habitat (west slope). On the other hand, *P. ocularis* foraged in the understorey inside intact forest on the west slope up to about 2200 m so long as there was a forest edge: on the west slope the forest edge extends up to about 2300 m, allowing this "open-country" species access to hunt in the adjacent habitat. Its occurrence only at the forest boundary on the south slope confirms this observation.

Estrildidae

Red-faced Crimson-wing *Cryptospiza reichenovii* was only observed once at the forest edge where a pair were foraging on the ground (west slope). Its apparent absence

in the forest interior may be due to the presence of *C. salvadorii*, although *C. reichenovii*'s preference for stream habitats (Dowsett-Lemaire 1989) suggests that it should be present near streams on the mountain.

Abyssinian Crimson-wing *C. salvadorii* occurred throughout the forest and is easily overlooked due to its secretive behaviour. It fed exclusively in the understorey, especially on the forest floor, and was fairly abundant at low to medium altitudes. It foraged alone or in pairs. It was extremely common on the west slope and rather uncommon on the southern gradient. This is probably indicative of its preference for dry forest or less intact forest habitats.

Grey-headed Negrofinch *Nigrita canicapilla* is often overlooked due to its secretive habits. This species occurred at the forest edge and glades, sometimes penetrating the interior near glades or open areas such as forest paths. Although it foraged in the understorey, several observations indicate that it also haunts the mid-stratum to canopy levels. It fed on seeds as well as invertebrates, which it obtained by hopping from branch to branch, carefully searching through foliage or branches.

Fringillidae

Oriole Finch *Linurgus olivaceus* fed on the ground and in the understorey. It occurred at high altitudes on the west slope and below 2000 m on the south slope and may have been overlooked on account of its secretive habits.

Thick-billed Seed-eater *Serinus burtoni* fed as above; however, it is more secretive in habits and less tame (exception: see breeding notes). It fed on ripe berries of *Rubus volkensii* which were growing in a small glade on the south slope. Its call is a short and high-pitched squeak, similar to that of *Coracina caesia*.

Streaky Seed-eater *S. striolatus* is restricted to the forest edge and the interior of thin, disturbed forest with an abundance of glades, such as that on the west slope. It is typically a species of montane grasslands, scrub and heath. However, when such habitats are near each other due to the presence of severely disturbed forest, its distribution is heightened. On the south slope, the forest is more intact and the small gaps present seem unsuitable for this bird.

Understorey forest birds: species diversity and comparison between aspects

In dealing with understorey forest birds, species diversity decreases with altitude on the south slope (Cordeiro in prep.), a pattern that is typical on other tropical mountains (Kikkawa & Williams 1971, Terborgh 1971, 1977, Prigogine 1980, Stuart 1983). However, this pattern did not hold true for the western gradient. The factors governing the observed patterns are discussed elsewhere (Cordeiro in prep.).

In regard to the understorey avifauna of both aspects, most species were found in reasonably similar numbers on both slopes. However, four forest-dependent birds (Eastern Double-collared Sunbird, Tropical Boubou, Montane Yellow Warbler, Grey-

backed Camaroptera) were very frequent on the western gradient and found only at the lower forest boundary or in the heath zone on the southern aspect, with some exceptions. In addition, three species (Olive Sunbird, Brown Woodland Warbler and Evergreen Forest Warbler) were very common on the south slope and less frequent on the western gradient. The opposite was true for the Abyssinian Crimson-wing and Rüppell's Robin Chat.

Many species appeared to prefer the open and disturbed forest habitats on the western gradient. Species like the Montane Yellow Warbler, Eastern Double-collared Sunbird and Tropical Boubou inhabited forest edges and glades and were uncommon where the forest was intact with a dense understorey. This may also be true for the crimson-wing and robin chat, although the different densities of these two species may also be due to preference for drier forest.

Conversely, the Brown Woodland Warbler, Olive Sunbird and Evergreen Forest Warbler are species typical of dense forest, as indicated on both aspects of the mountain. All three were very common in forest with a high density of trees and shrubs and less common in the disturbed and open forest on the western gradient. In addition, possible competition with the Cinnamon-bracken Warbler and/or habitat quality may have negatively influenced the distribution of the Evergreen Forest Warbler.

Since this study was conducted during the cold season and the start of the hot season, it remains to be seen whether the densities of some birds (especially crimson-wing, sunbird and warblers) will increase or decrease on each respective slope during the hot months and long rains. Nevertheless, apart from habitat type and quality, which appear to be the main influences on the distributions of the species mentioned above, season and competition may also be important factors to consider. Hence, long-term studies are necessary to completely understand the ecology of the understorey avifauna of this mountain.

Composition of birds in the narrow natural forest corridor

Only 12 understorey forest species were recorded in the natural corridor above the plantations near Scota (Fig. 3b), despite a sufficient amount of mist-netting (i.e. 7020 n-m-h; see Table 3). The most abundant species were mainly forest edge or glade dwellers whereas several typical forest interior species were either absent or scarce. This result may be associated with the very disturbed nature of the habitat due to selective logging and possibly old fires.

Altitudinal distributions

The altitudinal distribution of all species recorded in the field are given in Table 2. Eight species (African Wood Owl, Bar-tailed Trogon, Cinnamon-chested Bee-eater, Striped-cheeked Greenbul, Nicator, Rüppell's Robin Chat, Black-headed Apalis, Crested Flycatcher; Table 2) reached higher elevations than reported in Britton (1980).

A further four species (Rufous Sparrowhawk, Dusky Turtle Dove, Scarce Swift and Cinnamon-chested Bee-eater; Table 2) were found at lower elevations than those reported in Britton (1980).

The factors governing a bird's altitude range are not clear-cut and may be a reflection of competition between species which share similar niches, habitat type and quality, temperature, availability of food and seasonal movements (Cordeiro in prep.). Thus, since many of these factors vary from one locality to another, it is probably of no surprise that some of the results here were obtained. Examples include the peculiar distributions of the greenbul, robin chat and apalis. These birds occurred at higher elevations on the west compared to the south slope (Table 2). In other cases, the extension of the forest at high or low altitudes would most likely affect the distribution of forest-dependent species (e.g. African Wood Owl, Bar-tailed Trogon, Dusky Turtle Dove). In fact, the known altitude ranges of some species will undoubtedly change with further research, especially during the very hot (January–February) and rainy (March–May) months.

Table 3. *Composition of understorey forest species in the natural corridor above the plantations. Species marked with a (*) were observed in the field and believed to be scarce because they were not netted or rarely seen. Some species may occupy both the forest edge and interior*

Species	Numbers captured
Forest edge and glade inhabitants	
Bar-throated Apalis	7
Cinnamon Bracken Warbler	5
Eastern Double-collared Sunbird	3
Montane Yellow Warbler	9
Streaky Seed-eater	1
Tropical Boubou	*
Forest interior inhabitants	
Abyssinian Crimson-wing	2
African Hill Babbler	2
Brown Woodland Warbler	*
Evergreen Forest Warbler	1
Montane White-eye	3
Mountain Greenbul	*
Northern Olive Thrush	1
Rüppell's Robin Chat	1
White-starred Forest Robin	3

Seasonal movements

Some tropical forest birds are known to move from higher to lower elevations during the cold season and vice versa during the hot season. This has been well documented for the Usambaras (Stuart 1983, 1989), Mt Mulange (Dowsett-Lemaire 1989) and other highland areas in Africa (Mackworth-Praed & Grant 1957, 1960, Benson 1982, Stuart & Jensen 1985, Stuart *et al.* 1987). Evidence of seasonal movements of understorey forest birds on Kilimanjaro is discussed elsewhere (Cordeiro in prep.); however, species that appeared to migrate during the study period are indicated in Table 2. Many of these species have shown evidence for vertical seasonal movements elsewhere in East Africa (Mackworth-Praed & Grant 1957, 1960, Benson 1982, Stuart 1983, Stuart & Jensen 1985, Stuart *et al.* 1987, Stuart 1989, Dowsett-Lemaire 1989, Jensen & Brøgger-Jensen 1992).

Breeding of forest birds

During the five-month study period 148 breeding records (including three suspected) of 40 species (including three suspected) were obtained. The breeding data for mostly forest-dependent species and a few non-forest species is shown in Table 4. Given that the study period covers only a fraction of the whole year, an attempt to distinguish any breeding pattern for the avifauna has not been made; however, these results are related to other studies. (A few additional records obtained in 1993 (Grimshaw pers. comm.) are listed in Appendix 1.)

Only a few long-term studies have been conducted on the breeding seasons of African forest birds (Moreau 1950b, Beesley 1973, Colston & Curry-Lindahl 1986, Dowsett-Lemaire 1989, Brosset 1990). Two major studies have summarized the breeding information of East African birds (Moreau 1950b, Brown & Britton 1980). Moreau (1950b) described the breeding seasons of terrestrial birds based on habitats and geographical regions. Brown & Britton (1980) present breeding data for 861 species in East Africa, many of which are forest birds. They divide the region into five climatic zones; Region D (which includes Mt Kilimanjaro), being characterized by its bimodal rainfall pattern: long rains from March–May and short rains from October–December. This method poses some flaws in that (i) the region being large, does not characterize any one locality particularly well, and extremities in both the monthly distribution and mean amount of rainfall may be observed (e.g. Voi: 549 mm, Amani: 1926 mm); (ii) breeding records of species in some months may be a result of prolonged drought conditions in a given year, thus distorting the normal breeding patterns of certain species (e.g. Brosset 1990); (iii) breeding records are not separated by altitude, thus incorrectly suggesting that some species have “prolonged or all month breeding” (Tye 1992).

In areas with only one wet and one dry season, breeding peaks during the wet season and is lower before and after this period (e.g. on Mt Nimba, Liberia, Colston & Curry-

Table 4. *Breeding records of mostly forest species and a few non-forest species on Mt Kilimanjaro obtained between August and December 1991. Numbers in parentheses include suspected breeding records*

Species	Months					Total	Altitude range (m)
	Aug	Sept	Oct	Nov	Dec		
Little Grebe					*	(1)	2100
Long-crested Eagle		*				(1)	1900
Scaly Francolin			2		1	3	1950–2050
Lemon Dove	1	1	1			3	1500–2400
Tambourine Dove			1			1	1900
Montane Nightjar	1					1	1900
Bar-tailed Trogon				1		1	2750
Cinnamon-chested Bee-eater				1		1	1500
Moustached Green Tinkerbird	1			2		3	1750–2200
African Hill Babbler			8	1	1	10	1600–1750
Striped-cheeked Greenbul			1			1	1600
Mountain Greenbul		2	1	1		4	2050–2200
Olive Mountain Greenbul	2	1	2	3		8	1750–2350
Rüppell's Robin Chat	*				1	1(2)	1750–2350
White-starred Forest Robin		4	6	5	2	17	1600–2050
Stonechat			1	1		2	2100–2200
Northern Olive Thrush	2					2	1900
Abyssinian Ground Thrush			2			2	2500
Bar-throated Apalis	1	2	3	2	3	11	1750–2500
Evergreen Forest Warbler					2	2	1700
Cinnamon Bracken Warbler	1		1	1		3	1750–2800
Grey-backed Camaroptera	1	1				2	1750–1900
Mountain Yellow Warbler		2		1	1	4	1900–2200
Brown Woodland Warbler			4	3	2	9	1600–2500
White-eyed Slaty Flycatcher		1				1	2200–2300
Forest Batis				2	1	3	1600–1900
Crested Flycatcher		1	1			2	1600–1750
African Pied Wagtail		2				2	2100
Tropical Boubou		2				2	2050–2200
Collared Sunbird				1		1	1500
Eastern Double-collared Sunbird			1	1		3	1750–2600
Olive Sunbird	1	1	3	2		7	1750
Montane White-eye	1	1	14	1	4	21	1600–2500
Baglafaecht Weaver		1				1	2200
Spectacled Weaver	1	1				2	1750–2050
Abyssinian Crimson-wing			4			4	2500
Grey-headed Negrofinch				1		1	2350
Oriole Finch					1	1	2200
Thick-billed Seed-eater					1	1	1700
Streaky Seed-eater			2			2	2500
Total	14(15)	23(24)	60	30	18(19)	145(148)	

Lindahl 1986). This pattern is similar for the Nyika Plateau in Malawi, except that most birds breed during the late dry season and early rains (Dowsett-Lemaire 1989). However, in western Cameroon, lowland forest birds breed throughout the year whereas montane species do so in the drier period and stop breeding at the onset of the rains (Serle 1981, Tye 1992). Tye (1992) found that 17 predominantly lowland species breed during the wet season at low altitudes but in the dry season at high altitudes coinciding with the breeding period of the montane avifauna.

In high altitude areas with bimodal seasons, most of the forest avifauna breeds during the short rains (Usambara Mountains: Moreau 1950b; Mt Kilimanjaro: Moreau 1936, 1950b; Mt Meru: Beesley 1973; parts of Region D: Brown & Britton 1980). The main wet season would appear unfavourable for most species due to (i) nest destruction by rain storms (Tye 1992); (ii) lower temperatures due to rains would involve greater incubation periods for eggs and nestlings (Beesley 1973, Tye 1992); (iii) low temperatures would hamper insect activity and abundance (Serle 1981, Buskirk & Buskirk 1976); (iv) fledglings may have better survival chances in the warmer season succeeding the short rains than in the colder period succeeding the long rains for reasons of temperature and insect abundance; and (v) long periods of rainfall could reduce the amount of time required for foraging (Gaston *et al.* 1979, Tye 1992). Thus the majority of montane species breed during the shorter rains when conditions appear more favourable for rearing young.

As earlier suggested by Moreau (1936, 1950b) and by evidence from the present study, this may be the case for many species on Mt Kilimanjaro. The bulk of breeding records were obtained in October and the number of records was lower before than after this month. Since the west and south aspects were covered at different times (except both aspects were surveyed in October) it is difficult to note any obvious differences between the populations of either aspect. Both populations appeared to begin breeding between late September and carried through to December and, possibly January. Interestingly, Moreau (1950b) noted that forest birds on the south slope breed before and during the short rains whereas those of the north slope, where the rainy season is not so marked nor heavy, breed in January and February. He based his idea on a mere 21 definite records from the north side where he carried out fieldwork for only two weeks in February 1938. Although his theory may be accurate, further information from all months of the year needs to be obtained before such a conclusion can be made firmly.

In addition, since the data from Kilimanjaro represent only half the year, for those species that had few or no breeding records and an abundance of immatures, breeding may take place prior to, during and at the end of the long rainy season. Moreau (1936), Mackworth-Praed & Grant (1960), Brown & Britton (1980) and Dowsett-Lemaire (1989) note several birds that occur on Kilimanjaro (e.g. Estrildid finches, apalis species, thrushes, Evergreen Forest Warbler, Montane Yellow Warbler) that exhibit this pattern in various parts of East Africa.

In conclusion, although these results indicate that breeding for most species does take place before and during the short rains, further research is definitely required to

understand the differences and similarities between aspects due to the differing climatic regimes. In addition, a long-term and year-round study is essential to pinpoint the actual breeding seasons of all forest elements on the mountain.

Breeding notes for selected species

Brown & Britton (1980) lack breeding data in some months for a number of species in Region D. Several records from Mt Kilimanjaro fill in some of these gaps, including new breeding records for three species in Region D (Table 5). In addition, two species (Rüppell's Robin Chat and Montane White-eye) noted not to breed during the short rains (Brown & Britton 1980) were found to do so on Kilimanjaro (Table 5).

The breeding records discussed below involve species with few breeding records in Region D or provide new data on breeding behaviour and nest site and structure.

Table 5. *Breeding data of species for months not noted by Brown & Britton (1980) in Region D*

Species	Laying month
Scaly Francolin	Oct
Tambourine Dove	Oct
Lemon Dove	Oct
Montane Nightjar	Aug
Moustached Tinkerbird	Aug, Nov
Mountain Greenbul	Oct, Nov
Rüppell's Robin Chat	Aug, Dec
Bar-throated Apalis	Aug, Sep, Oct, Dec
Evergreen Forest Warbler	Dec
Cinnamon Bracken Warbler	Aug, Oct, Nov
Mountain Yellow Warbler	Sep, Dec
Brown Woodland Warbler	Oct, Dec
Forest Batis	Oct, Nov
Crested Flycatcher	Sep, Oct
Tropical Boubou	Sep
Eastern Double-collared Sunbird	Aug
Olive Sunbird	Aug, Oct
Abyssinian Crimson-wing	Oct
Grey-headed Negrofinch	Nov
Thick-billed Seedeater	Dec
Streaky Seedeater	Oct

Little Grebe Short courtship displays by a pair were observed in early December, indicating that they were possibly going to breed in that month or in January.

Long-crested Eagle An individual was observed giving a display flight fitting the description in Brown *et al.* (1982). It was possibly breeding in September. An individual flew high in the air and then descended vertically in an undulating manner, calling infrequently during flight. When perched on a tree after an aerial display, the eagle called loudly. This display was irregular and continued for at least an hour.

Scaly Francolin Two family parties were observed in early November, the chicks of which were most likely hatched in October. On a different occasion, a fledgling and two adults were seen just off a forest path. The adults ran away in separate directions, probably trying to divert my attention from the chick, which was probably a few days old. Meanwhile the chick concealed itself in the short vegetation. When the chick was caught the adults ran towards me almost to the point of attacking. The chick weighed 26.8 g and it had two brown stripes running vertically down the back on an otherwise yellowish coat.

Lemon Dove Mackworth-Praed & Grant (1957) note that the nest of this dove is "substantial... with a well-defined cup", a few feet from the ground in an understorey shrub. Urban *et al.* (1986) mention that the nest is found at 1–9 m "in tangle of creepers, on debris in fork of tree, or in middle of horizontal bough; nearly always in deep shade." A nest built with dry twigs found on 25 September, differs from the above descriptions in that it was built where the horizontal thin branches of at least two species of shrubs intertwined. It was well-covered by the leaves of the shrubs (which were about 3 m high) and sat a little over a metre from the ground; the cup of the nest was very shallow. Only one egg (faint pink to light tawny in colour) was present.

Montane Nightjar At the end of August, an individual was found nesting on the ground in short secondary vegetation (succeeding a fire), amidst dead leaves. Fry *et al.* (1988) note that this bird lays its eggs on bare ground, for example near a boulder or in a "burnt clearing". Two eggs (average length 25.6 mm; average diameter at centre 18.5 mm) sat close together on some dead leaves. The eggs were faint pinkish with irregular rufous brown spots. The adult bird sat on the nest throughout the day, remaining well concealed in the leaf litter. It was approached within 1.5–2 m and yet it remained stationary. It flew off only when an accidental noise was made or if one approached too close.

Bar-tailed Trogon Two dependent juveniles were observed being fed by their parents at about 2900 m in *Podocarpus–Erica* forest in December. Fry *et al.* (1988) note a juvenile being fed by its parents in November (Kenya).

Cinnamon-chested Bee-eater A pair were suspected to be breeding at the forest edge in November on the south slope. In December, a juvenile was observed being fed by an adult where the initial observations were made on the adult pair.

Montane Yellow Warbler Two pairs were noted to be breeding in September on the west aspect. One pair was continuously caught in mist-nets over a three-day period. They seemed to be taking turns to incubate the eggs; the nest of which was situated in the deep undergrowth of a very thorny bush. Brown & Britton (1980) provide only three records for Region D (July, August, November) and Fuggles-Couchman (1986) noted nest-building October 1943 at Mbulu Mbulu.

Brown Woodland Warbler Nests of this species are built "in the side of a bank or against a fallen log or root" (Mackworth-Praed & Grant 1960). Two nests of this warbler were located in a hollow area on the side of a bank along a forest path (c. 75 cm above ground level). The nests were similar to those described by Mackworth-Praed & Grant (1960) but were also lined with moss and lichens. Both contained three eggs. These nests were well concealed and had it not been for the rapid "escape" flight of the adult, they would have never been found.

Forest Batis Brown & Britton (1980) do not provide any breeding records for this species in East Africa and Fuggles-Couchman's (1986) record in December 1956 from the Ulugurus is apparently the first for this region. Three females with large and very fresh brood patches were netted in September and October, thus adding to the East African records.

Tropical Boubou A female, probably killed by a mongoose whilst in a mist-net, laid two light bluish eggs before dying. This was on the west slope on 28 September.

Eastern Double-collared Sunbird This sunbird was breeding in October. Its nest was placed about 3 m above the ground at the top of a heath bush on the west slope. The nest was rather oval and not spherical (Mackworth-Praed & Grant 1960) with an opening at the top.

Montane White-eye Mackworth-Praed & Grant (1960) state that the nest of this bird is a "deep cup of fibres or lichen lined with fine fibres and attached or slung to large herbs or heaths." Several nests of this species were found on both slopes that matched the above description, except that some were also lined with moss. One nest was constructed in the vertical fork of a *Justicia* shrub, approximately 1 m from the ground. Another three were located in clumps of ferns, reasonably protected from above by fern leaves. These nests were slanted and about 50–75 cm from the ground. Two nests were also built about 2 m high in a horizontal fork of the tree *Tabernaemontana holstii* where they were well protected from rain by the large trees above. Another nest was constructed approximately 3 m off the ground on a horizontal forked branch of the tree

Podocarpus latifolius. Interestingly, this otherwise gregarious species breeds away from conspecifics and its nest is not always located in large herbs or shrubs, but also in trees at mid-stratum level. The regular number of eggs was two although a couple of nests contained one or three eggs. One nest in a fern bush contained a similar-sized egg that was pale blue, suggesting possible parasitism by a cuckoo, two of which are known to lay such eggs (Red-chested Cuckoo, Emerald Cuckoo: Mackworth-Praed & Grant 1957). The nest was subsequently abandoned.

Oriole Finch Fuggles-Couchman (1986) apparently provides the first East African breeding record for this finch. A female with a large and fresh brood patch was netted on the west slope in October. The male was also caught in the same net.

Thick-billed Seed eater A pair of this species remained in a dense area of the understorey for long periods at a time (west slope: 8–11 December) and were easily approachable. Both were netted, one of which had a large fresh brood patch. They appeared to be guarding young or eggs but the site was not investigated.

Are any birds extinct on Kilimanjaro?

On first impression of the literature on the forest avifauna of Mt Kilimanjaro, and a subsequent visit to the mountain, one may be fooled by the absences of several birds (see “Additions and deletions to the forest avifauna”). The absences of most of these birds is attributed to misidentifications, the broad use of the locality “Kilimanjaro” and, extremely localized distributions.

Thus, there is no definite evidence for the extinction of any bird species on the mountain since the late 1800s. Before assuming extinctions based on previous literature, especially older papers, it is necessary to conduct long-term studies in a given locality. Thus, short-term studies on local species extinction should be treated with great caution. As illustrated in some studies (e.g. Benson 1948, Benson & Benson 1977, Leck 1979), there are many discrepancies in viewing species as locally extinct in various parts of the world. Dowsett (1980) carefully points these out for cases in Africa, including his own study (Dowsett 1980): (i) short study periods, (ii) overlooking these species due to their secretiveness, (iii) not visiting the exact area where the bird was initially recorded and (iv) a combination of all three.

Areas surveyed for longer periods yield more accurate results (e.g. Stuart 1983). Stuart (1983), who studied the avifauna of the Usambara Mountains in Tanzania for over three years, notes no difference in the forest species composition since the earlier detailed studies by Moreau (1935) and Sclater & Moreau (1932–33).

The ornithology of Mt Kilimanjaro has been well-surveyed since the time of the early European scientific expeditions; however, as Moreau (1950a) pointed out, there are still gaps to fill. For example, many such gaps were filled since Moreau's last documentation on the avifauna of Mt Kilimanjaro. He notes the absence of the Red-

faced Crimson-wing and the rarity of the Abyssinian Crimson-wing on the mountain (Moreau 1936 & 1944). Recent investigations suggest the reverse. The present study, though only five months long, has provided new information on many forest birds of Mt Kilimanjaro. Nevertheless, in order fully to understand the ecology of the avifauna, a longer study would be crucial.

The conservation of forest birds on Mt Kilimanjaro

African birds directly and indirectly face imminent threats from the development and exploitation of their habitats. As many as 172 species of the Afrotropical and Malagasy regions were considered threatened by Collar & Stuart (1985), 67.5 per cent of these from the islands and the rest from the continent. Of these, two are believed to be extinct, 28 endangered, 15 vulnerable, 31 indeterminate, 78 rare and 18 insufficiently known. Both extinctions were documented from islands, although Collar & Stuart (1985) mention two mainland birds that have not been observed for over 50 years.

In Collar & Stuart (1985), forest or forest-dependent birds represent 65 per cent of the 97 Afrotropical species listed as threatened. They show that the distributions of most of these species centre on the Upper Guinea lowland forest, the forests in western Angola, the montane and lowland forests of Cameroon, the lowland and montane forests along the Albertine Rift (parts of Zaïre, Uganda and Rwanda), and the forests of eastern Kenya and Tanzania. The last three areas are considered centres of high forest bird diversity and endemism (Moreau 1966, Diamond & Hamilton 1980). Given these descriptive data, a dismal situation is presented for many forest birds in Africa. This is chiefly because many of the areas richest in bird species are being degraded by various human pressures. Using Tanzania as an African example, forests cover less than 1.5 per cent of the total area of the country and yet are estimated to be cut down at a rate of 100 km² per annum (Sayer *et al.* 1992). Given this alarming rate, and the high bird species diversity and number of endemics in some of these forests, many extinctions are foreseeable in the next few decades.

Habitat degradation, in particular of forests, can be due to land development in the form of agriculture (Stuart & Hutton 1977, Brown 1981, Collar & Stuart 1985, Maclean 1993), agroforestry (Collar & Stuart 1985, Lamprey *et al.* 1991, Maclean 1993) and selective logging (Thiollay 1986, 1992), amongst other factors. Most of these means of destruction have fragmented forests and have had negative effects on forest birds (e.g. South America: Willis 1979, 1980, Lovejoy *et al.* 1984, Thiollay 1986, 1992; Africa: Carlson 1986, Blankespoor 1991, Newmark 1991a).

In regard to the effects on forest bird populations, forest fragmentation is more important than is mere reduction of the forest size: the reduction of forest area affects forest edge birds whereas decrease in diameter affects forest-interior species (Dowsett 1980). Thiollay (1985) observed that the extinction rate of forest species is inversely correlated to the area of a reserve, and thus those species that show seasonal movements require broader habitat types and larger areas. This can also be applied to

the forest on Mt Kilimanjaro which, as earlier stated, is almost completely fragmented into two parts by huge plantation forests (see Grimshaw & Foley (1991) for details on forest conservation on Kilimanjaro). If altitude-specific birds require to cross from one part of the forest to another, and given that many forest-interior species are inhibited to cross gaps between their habitats (Diamond 1971, Willis 1979, Karr 1982, Newmark 1991a), then these plantations would serve as barriers against their movement.

How may we rectify this situation? The strategy of using forest corridors to link the forests seems to be the solution. The concept of wildlife corridors has been viewed by scientists and conservationists as a possible solution to avoid species losses. Allowing small areas of land to be devoid of any human-made barrier (e.g. farm or settlement) between the migration centres of wild animals would maintain genetic heterogeneity between these mobile populations.

MacClintock *et al.* (1977), Willis (1979) and Newmark (1991a, b; 1993), for example, state that corridors between forest patches could enable greater species diversity through recolonization processes. Thus in the case of the forest birds on Mt Kilimanjaro, possible local extinctions could be avoided in the future through such practical innovations. Research in this area needs to be emphasized in parts of East Africa where the forest habitats have already been fragmented. In the case of Mt Kilimanjaro, a lot more information is needed before the idea of introducing corridors can be considered. These recommendations are outlined below:

1. Long-term research is essential if one is to understand the complexities of bird populations and their horizontal and vertical movements through the forest on Mt Kilimanjaro. Transects need to be conducted on at least four aspects of the mountain (i.e. north, south, east and west) during the warm and cold seasons. This information might not only yield additions to the forest bird check-list, but it could also indicate differences in the composition and distribution of birds relative to aspect or forest type.
2. Population densities and distribution patterns of uncommon or scarce species (e.g. Green Ibis, Abyssinian Ground Thrush, Grey-Cuckoo Shrike, Abbott's Starling and Sharpe's Starling) as well as altitudinally-restricted species (see Table 2) need to be assessed. This information might indicate whether or not their populations are non-viable and if the populations are negatively affected by the conifer plantations.
3. Given that some bird populations might be non-viable on Mt Kilimanjaro, it would probably be necessary to determine whether or not individuals can cross the pine plantations. Hence, a long-term ringing project should be established covering either side of the plantations on an altitudinal basis. This project would confirm whether or not birds move regularly across the plantations.
4. The current condition of the natural corridor above the West Kilimanjaro pine plantations is very poor and almost devoid of tall old trees. Although Lamprey *et al.* (1991) state that the corridors are about 1 km wide, the actual width in some place approaches 300–500 m. In such narrow and open corridors, the forest bird community is very depauperate (see Table 3). Therefore, these corridors must be taken care of to avoid forest areas being completely separated.

5. The wild bird trade has escalated since 1985, especially in parts of Africa. For example, Tanzania is now the second largest bird exporter in the world, after Argentina (Howell 1992). The bird trade directly threatens species that are in demand as cage-birds in Japan, Europe and the United States of America. Howell (1992), on the other hand, sees that the trade is already having its effects on the Fischer's Lovebird *Agapornis fischeri*, a non-forest Tanzanian endemic which, he states, is now scarce outside protected areas. Even in these protected areas, they are being taken illegally.

Careful biological monitoring of individual species is urgently required otherwise this trade cannot be sustainable (Howell 1992). No study has been conducted on populations of individual species in the African bird trade. This is crucial as several species were being trapped in the forest/game reserve on Mt Kilimanjaro (see also Grimshaw & Foley 1991). These included the Red-fronted Parrot, Hartlaub's Turaco and numerous finches. There is no information on the abundance of these species on this mountain or how many are being trapped per day for this trade and how this affects the bird populations. Trapping apparently continues throughout the year. Without this data base and firm regulations on the trade, there appears little doubt that Mt Kilimanjaro could face the local extinction of some species in the future.

6. Snaring for doves and francolins, amongst other animals takes place, especially near human habitations. In one case, when returning to a net ride near the Scots area on the west slope, 16 snares were found, three of which contained Lemon Doves. Two doves were released although their tarsi were swollen and one subsequently died. These doves are uncommon on the mountain and so snaring could have serious effects on the local population. Unfortunately, such activity is hard to monitor and regulate and therefore no immediate solutions can be sought.

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Appendix 1

Additional breeding records from Kilimanjaro Timbers at about 2000 m (J. Grimshaw, pers. comm. 1993)

Species	Date	Activity and notes
African Black Duck	May 1990	with chicks in Lerangwa Korongo
White-backed Vulture	Aug 1993	immature in nest in forest
African Harrier Hawk	Apr–May 1993	suspected breeding
Mosque Swallow	10 Feb 1990	nesting at sawmill

Bird-ringing recoveries from Ethiopia¹: II

J. S. Ash

A previous list of ringed birds found in Ethiopia, and resulting from birds ringed in Ethiopia and recovered elsewhere, was given in Ash (1981). The recoveries in the present report (Table 1) result from birds ringed in 1969–1980 by the ringers listed in the earlier report, from recent ringing in other countries providing recoveries in Ethiopia, and the discovery of some old recoveries in national ringing schemes' data banks.

Gerhard Nikolaus has been particularly helpful in tracking down old recoveries in German and Russian archives, and in elucidating some recoveries over which there had been queries. Now that the situation in Ethiopia is approaching normality, it is to be hoped that bird-ringing will be resumed, particularly of Palaearctic migrants. Until a national ringing scheme is instituted in Ethiopia, I shall continue to collate recoveries, and shall be most grateful for any information sent to me direct.

The conventions and symbols used in the following list follow Spencer & Hudson (1978). The periods elapsing between ringing and recovery are given in days. Of special interest is a Cattle Egret *Bubulcus ibis*, providing the first definite evidence of a Palaearctic bird of this species in the Afrotropics; a second Ruff *Philomachus pugnax* from Yakutsk in eastern Siberia; an inland Great Black-headed Gull *Larus ichthyæetus*; an unexpected relatively long-distance movement by an endemic White-backed Black Tit *Parus leuconotus*; and long-lived birds include a nine-years-old Rüppell's Long-tailed Starling *Lamprotornis purpuropterus*, ten-years-old Tacazze Sunbird *Nectarinia tacazze* and White-vented Bulbul *Pycnonotus barbatus*; and 12-years-old Spur-winged Plover *Vanellus spinosus* and Black-headed Weaver *Ploceus cucullatus*.

Table 1. *Ringing recoveries involving Ethiopia and Eritrea*

Note: where no country name is given, the locality is in Ethiopia;
all rings are 'London' unless stated

Pelecanus onocrotalus White Pelican

Z3—	1	1972-74	Lake Shalla, (Shoa), 7°27'N, 38°28'E
	vv	1978 or '79	Lake Ras Amer, 12°35'N, 35°07'E, Dinder National Park, Sudan, 680 km NW, > 1309 d

Nycticorax nycticorax Black-headed Night Heron

Israel	1	?	Hula Reserve, 33°05'N, 35°38'E, Israel
?	?	before 87	Ethiopia (vide Paz 1987)

¹ and Eritrea

***Bubulcus ibis* Cattle Egret**

Moscow 1 01.07.80 Kalinovski, 39°00N, 48°50E, Liman, Kyzil-Agach, **Azerbaijan**

C301698 X 20–31.10.80 Saraye Region, 11°03N, 39°33E, 3220 km SSW, >111 d
The first proof of a Cattle Egret of Palaearctic origin in the Afrotropical Region (Nikolaus1992).

***Ciconia ciconia* White Stork**

Moscow 1 25.06.65 Tukums, 56°58N, 23°10E, (Riga), **Latvia**

A19818 + early 03.70 Alamata, 12°26N, 39°35E, Rayanokobo (Wollo), 5000 km SSE, 1713 d

A 19818 was originally reported as A 19813 (see also under *Neophron percnopterus* in Ash 1981), a ring actually placed on a *Cygnus olor* Mute Swan. Some of the figures 8 and 3 were difficult to separate on this series of rings, and it is now thought that 19818 is the correct number (Dr I. Dobrinia, pers. comm., per G. Nikolaus).

Helgoland 1 11.07.79 near Dannenberg, 53°05N, 11°06E, **Germany**

BB0208 /?/ 24.01.80 35 km N of Gondar, 12°58N, 37°46E, (Begemdir), 5860 km SE, 197 d

Gdansk 1 18.07.84 Sroczewo, 52°06N, 17°11E (Poznan), **Poland**

V6467 + 00.12.84 Tacazze River, c. 14°N, 39°E, West Tigray, 4400 km SE, c. 136 d ("Killed with stones by natives")

Gdansk 1 21.06.87 Debniaki, 52°30N, 19°00E, Wloclawek, **Poland**

VA731 /?/ 13.06.88 Wollega Province, c. 9°N, 36°E, 4850 km SSE, 357 d

The following Helgoland recoveries were listed in Ash (1981), but now have amended data derived from the Vogelwarte Helgoland data base:

Helgoland 1 10.07.58 Grosswisch, 53°51N, 9°22E, Schleswig Holstein, **Germany**

H4108 X (14.03.61) 10°54N, 40°00E, Wollo Province, 5150 km SE, c. 977 d

Helgoland 1 14.06.63 Freiburg-Laak, 53°49N, 9°17E, Stade, **Germany**

H9141 (04.12.64) 10°33N, 37°35E, SW of Lake Tana, Gojjam, 5200 km SE, c. 528 d

Helgoland 3 01.07.34 Coomerau b. Klix, 51°16N, 14°32E, **Germany**

205062 0 (29.01.35) Dera, 10°10N, 38°59E, Salale, Shoa, 5079 km SE, 212 d

***Anas penelope* Wigeon**

Moscow 2 20.07.60 Solonchak, 48°44N, 62°12E, **Kazakhstan**

E556.355 /?/ 08.01.61 20 km N of Addis Ababa, 9°15N, 38°43E, 4650 km SSW, 172 d

***Circaetus gallicus pectoralis* Black-chested Snake Eagle**

1080714 5 04.05.76 Chifra, 11°39N, 40°01 E, Melle, Wollo

+ 24.07.81 shot where ringed, 1912 d

***Buteo buteo* Common Buzzard**

The identification of the recovery of Rossitten 1286 included in Ash (198 1) under this species had been queried as a possible Honey Buzzard *Pernis apivorus* on the grounds that *B. buteo* was unknown in the Afrotropical Region. However, the latter species is now known to be a not uncommon visitor to Ethiopia, Djibouti and Somalia, so the reported recovery can be regarded as valid.

***Buteo augur* Augur Buzzard**

HW26581	7	16.05.76	15 km NE of Debre Berhan, 9°43N, 39°38E, Shoa
	X	16.11.80	near Debre Berhan, 9°41 N, 39°3 1, Shoa, 13 km WSW, 1645 d, (ailing)

***Vanellus spinosus* Spur-winged Plover**

DS88203	2	19.10.71	Lake Abiata, 7°36N, 38°40E, Shoa
	X	30.04.83	where ringed, 4211 d
DS92172	6	19.04.76	Lake Langano, 7°34N, 38°51E, Shoa
	X	08.01.80	where ringed, 1359 d

***Philomachus pugnax* Ruff**

DA10905	4	06.10.76	Koka, 8°24N, 39°02E, Shoa
	+	20.05.79	Nizhniy-Bestyakh, 61°09N, 128°46E, Kachikatsy, Western Yakut, Russia , 9582 km, 956 d

***Larus ichthyaetus* Great Black-headed Gull**

Moscow	3	07.06.76	Alakol Lake, 46°06N, 81°25E, Kazakhstan
A121340	+	21.12.76	Bahar Dar, 11°36N, 37°25E, Gojjam, 5650 km SW, 197 d

***Larus fuscus* Lesser Black-backed Gull**

Stockholm	1	27.06.45	Ängholmarna, 55°58N, 14°26E, Skåne, Sweden
P2258	+	11.10.46	Massawa, 15°38N, 39°28E, Eritrea, 4800 km SE, 471 d
Stockholm	1	23.07.72	Njurunda, 62°17N, 17°30E, Medelpad, Sweden
8035138	(X)	30.07.73	Gherar, Massawa, 15°38N, 39°28E, Eritrea, 5300 km SE, 372 d

***Larus cirrocephalus* Grey-headed Gull**

EF72581	6	21.05.73	Lake Abiata, 7°36N, 38°40E, Shoa
	X	10.01.94	Lake Zwai, 8°01N, 38°50E, Shoa, 48 km NNE, 7539 d ("bird found")

***Sterna caspia* Caspian Tern**

Helsinki	1	28.06.73	Hamugrundet, 59°55N, 24°01E, Inkoo, Uusimoo, Finland
HT020181	X	25.12.73	Lake Langano, 7°34N, 38°51E, 6000 km SE, 180 d

<i>Stockholm</i>	1	16.06.86	Stora Garkast, 58°40N, 17°35E, Hartsö, Södermanland, Sweden
7091348	X	04.07.87	Lake Abiata, 7°37N, 38°40E, Rift Valley, Shoa, 5961 km SSE, 383 d

***Pterocles quadricinctus* Four-banded Sandgrouse**

EB71575	4m	26.04.76	Koka, 8°24N, 39°02E, Shoa
	+	04.03.78	shot 100 km S of Addis Ababa (where ringed?), 677 d

***Streptopelia lugens* Dusky Turtle Dove**

DS92215	3J	22.12.73	Addis Ababa, 9°02N, 38°46E, Shoa
	v	20.09.75	where ringed, 637 d

***Ceryle rudis* Pied Kingfisher**

CN35439	2	13.10.70	Lake Abiata, 7°36N, 38°40E, Shoa
	v	19.06.71	Lake Langano, 7°34N, 38°51 E, Shoa, c. 14 km SE, 249 d
CN36755	2	13.10.71	Lake Abiata
	+	early 01.72	shot Lake Langano, c. 14 km SE, >80 d

***Merops pusillus* Little Bee-eater**

SA07043	2f	17.02.71	Didessa, 9°02N, 36°09E, Wollega
	+	01.10.71	shot where ringed, 226 d

***Hirundo rustica* Eurasian Swallow**

Moscow	2	12.09.69	Chokpak Pass, 42°3 IN, 70°38E, Kazakhstan
S481544	/?/	10.11.69	Coastal Red Sea, 16149N, 39°13E, Eritrea, c. 4500 km SW, 60 d
Moscow	2	07.05.88	Chokpak Pass, Kazakhstan
XB696262	/?/	00.11.88	Lake Zwai, 7°57N, 39°07E, Shoa, c. 5500 km SW, 543 d

***Pycnonotus barbatus* White-vented Bulbul**

BP24175	2	31.07.72	Gambela, 8°15N, 34°35E, Illubabor
	v	14.09.75	where ringed, 1140 d
BP25907	4	04.11.73	Aseita, 11°34N, 41°27E, Wollo
	v	28.07.83	near Djibouti border at 11°54N, 41°30E, 37 km NE, 3553 d

***Dryoscopus gambensis* Northern Puffback**

BJ98826	2	02.08.70	Didessa, 9°02N, 36°09E, Wollega
	X	05.11.71	fresh dead, where ringed, 460 d

***Laniarius aethiopicus* Tropical Boubou**

CJ38004	4	25.02.74	Addis Ababa, 9°02N, 38°46E, Shoa
	+	05.11.71	killed by sling shot, where ringed, 440 d

***Turdus abyssinicus* Olive Thrush**

CJ74690	4	09.07.76	Addis Ababa, 9°03'N, 38°42'E, Shoa
	v	05.03.81	where ringed, 1697 d
CJ74968	3J	10.07.76	Addis Ababa
	X	09.05.77	hit window where ringed, 303 d

***Melaenornis chocolatina* Abyssinian Slaty Flycatcher**

JX12457	2	22.07.76	Addis Ababa, 9°02'N, 38°45'E, Shoa
	+	21.03.82	shot where ringed, 2067 d

***Parus leuconotus* White-backed Black Tit**

JX11708	4	14.07.75	Addis Ababa, 9°02'N, 38°46'E, Shoa
	X	21.08.83	dying at Awasa, 7°03'N, 38°28'E, Sidamo, 223 km SW, 2960 d

***Nectarinia tacaze* Tacaze Sunbird**

JJ20821	2f	06.11.73	Addis Ababa, 9°02'N, 38°46'E, Shoa
	X	05.07.83	where ringed, 3521 d

***Ploceus cucullatus* Black-headed Weaver**

CJ38318	4	19.05.74	Gambela, 8°15'N, 34°35'E, Illubabor
	+	24.09.86	where ringed, 4511 d

***Quelea quelea* Red-billed Quelea**

NE47876	4	30.05.80	Kibish Hills, 5°05'N, 35°57'E
	+	26.07.82	Lafon, 5°02'N, 32°27'E, Southern Region, Sudan, 394 km W, 787 d (killed by spraying)
NE460—	3J	26.07.80	Ambo Pond, 4°38'N, 37°30'E, Yavello, Sidamo
	v	28.10.81	10 km S of Meki, 8°05'N, 38°51'E, Lake Zwai, Shoa, 450 km N, 459 d
NE49968	3J	28.07.80	near El Gumu, 4°30'N, 38°05'E, Sidamo
	+	01.05.84	Mugali, 3°35'N, 32°04'E, near Nimule, Sudan, 675 km WSW, 1373 d (killed by catapult)

***Lamprotornis purpuropterus* Rüppell's Long-tailed Starling**

CJ38494	6	20.09.74	Aseita, 11°34'N, 41°27'E, Wollo
	v	28.07.83	near Djibouti border, 11°54'N, 41°30'E, 37 km NE, 3233 d

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Weights of migrant Palaearctic *Sylvia* warblers in Ethiopia

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Of the eight, possibly nine, species of Palaearctic *Sylvia* warblers recorded from Ethiopia as non-breeding visitors, over 1700 individuals of seven species were weighed—all captured, incidentally, during an investigation into African birds. Eritrea has been separated off recently, but the present data were all collected from within the present-day boundaries of Ethiopia.

In general, migrants arrive in Ethiopia with light weights in the autumn, maintain relatively stable 'non-migratory' weights, and refatten before departure. Fat deposits are laid down as fuel for long flights, and some species undertake a 'step-migration' in which successive stages of intermediate fattening are required for these additional stages. Variations on this theme occur from species to species, and some of them apparently move over shorter distances without recourse to major lipid deposition.

Table 1. Seasonal weights of Palaearctic *Sylvia* migrants in Ethiopia

Month	mean	SD	range	n	mean	range	n
<i>Sylvia atricapilla</i> Blackcap							
Sep	17.04	1.24	15.0–19.1	16	17.14	12.1–22.8	266
Oct	17.49	2.17	12.1–22.8	63			
Nov	17.14	1.32	14.3–21.0	107			
Dec	16.72	1.38	14.0–22.1	52			
Jan	17.68	1.85	13.3–20.9	19			
Feb	16.38	2.39	12.8–20.0	9	19.68	14.1–30.5	371
Mar	19.56	2.77	14.7–29.3	191			
Apr	19.86	3.75	14.1–30.5	167			
May	19.19	3.13	15.0–27.6	13			
Jun	15.9	—		1			
Total	18.62		12.1–30.5	638			
<i>Sylvia borin</i> Garden Warbler							
Sep	17.29	1.62	14.0–20.2	40	17.16	12.7–22.2	130
Oct	17.17	2.00	12.7–22.2	74			
Nov	16.63	1.37	14.3–18.8	8			
Mar	17.06	1.11	15.9–18.9	8			
Apr	19.69	3.83	14.5–32.5	149			
May	20.92	4.61	15.5–34.3	53	20.01	14.5–34.3	202
Total	18.84		12.7–34.3	332			

continued

Month	mean	SD	range	n	mean	range	n
<i>Sylvia communis</i> Whitethroat							
Aug	14.05	1.01	13.1–16.0	6	13.74	10.9–17.8	329
Sep	13.65	0.93	11.0–15.1	80			
Oct	14.09	1.46	11.0–17.8	115			
Nov	13.91	1.46	11.5–17.1	33			
Dec	13.64	1.16	12.0–16.8	14			
Jan	13.79	0.64	13.1–15.0	10			
Feb	13.66	0.89	12.6–14.9	8	15.83	11.3–22.1	29
Mar	13.13	1.27	10.9–15.8	63			
Apr	15.06	2.16	11.3–20.5	251			
May	20.68	1.07	19.8–22.1	4			
Total	13.91		10.9–22.1	358			
<i>Sylvia curruca</i> Lesser Whitethroat							
Sep	12.10	–		1	11.33	9.1–15.9	173
Oct	10.99	0.77	9.3–12.1	25			
Nov	10.96	0.77	9.1–12.7	45			
Dec	11.26	0.87	9.6–13.0	27			
Jan	11.23	0.74	9.6–12.3	17			
Feb	11.83	0.96	9.8–15.9	58			
Mar	12.57	1.77	9.1–18.3	681	12.60	9.1–18.3	69
Apr	14.90	–		1			
Total	11.70		9.1–18.3	242			
<i>Sylvia nisoria</i> Barred Warbler							
Oct	23.51	2.88	19.6–26.7	8	23.65	19.6–28.0	64
Nov	24.02	2.70	20.2–28.0	10			
Dec	23.94	1.17	22.0–24.9	5			
Feb	23.55	1.54	20.0–26.8	41			
Mar	23.18	1.84	19.0–27.0	60	23.11	18.7–27.0	70
Apr	22.70	2.55	18.7–26.3	101			
Total	23.37		18.7–28.0	134			
<i>Sylvia hortensis</i> Orphean Warbler							
Dec	22.23	0.15	22.1–22.4	3	22.75	20.1–25.3	20
Feb	22.84	1.43	20.1–25.3	17			
Mar	23.90	1.71	22.0–25.3	3	23.90	22.0–25.3	3
Total	22.90		20.1–25.3	23			

continued

Month	mean	SD	range	n	mean	range	n
<i>Sylvia mystacea</i> Ménétries' Warbler							
Oct	9.84	0.77	8.7–10.7	5	9.70	8.3–11.4	27
Nov	9.53	0.60	8.3–10.4	15			
Dec	10.10	1.27	9.2–11.0	2			
Jan	9.94	0.94	9.1–11.4	5	10.47	9.1–12.1	7
Feb	10.47	1.20	9.1–12.1	7			
Total	9.83		8.3–12.1	34			

Weight data are presented on a monthly basis (Table 1), and some background information is provided against which changes in body mass can be assessed. This includes dates of arrival in and departure from Ethiopia, distribution of each species within Ethiopia and, where known, the subspecies involved. There is some additional information to that included in Ash (1980). All weights were obtained from freshly netted live birds, using frequently calibrated Pesola spring balances graduated in grams, and further estimated to the nearest 0.1 g. Retrap weights, where they follow a stopover interval of one night, have been included.

The following seven species, with their numbers, are considered here: 638 Blackcaps, 332 Garden Warblers, 358 Whitethroats, 242 Lesser Whitethroats, 23 Orphean Warblers, 34 Ménétries' Warbler, and 134 Barred Warblers. The only other Palaearctic migrant *Sylvia* in Ethiopia and/or Eritrea, but not weighed, is the Desert Warbler *S. nana*. Rüppell's Warbler *S. rueppelli* is doubtfully recorded, and one resident species, the Red Sea Warbler *S. leucomelaena* also occurs.

Blackcap *S. atricapilla*

S. a. atricapilla and *S. a. dammholzi* are recorded. Some overwinter, but most pass southwards, apparently in a casual nomadic movement, with a tendency to concentrate at abundant food supplies. They occur throughout the country, except in the arid southeast, between 26 August and 25 May. Few are recorded 3 December – 16 January, and there was a summer occurrence on 18 June, and an earlier record in July 1870 is given by Antinori & Salvadori (1873). The mean weight before departure in March – May (19.86 g) is 18 per cent above the lowest mean monthly weights (16.8 g), and the heaviest bird at 30.5 g was 252 per cent heavier than the lightest (12.1 g).

An exceptional spring passage occurred on a small island, Debre Mariam (13°56'N, 39°22'E) at 1800 m in Lake Tana, from 25 March to 5 April 1977, when 132 were caught and ringed.

Garden Warbler *S. borin*

Probably all are *S. b. woodwardi*. Passage migrants occur 22 August – 24 November and 5 March – 27 May, throughout the country except for the arid southeast. There are no overwintering records in Ethiopia, although there are from slightly further south in Kenya (Britton 1990). Mean monthly weights prior to departure in May (20.92 g) are

26 per cent above the lowest mean monthly weight of 16.63 g. The heaviest bird at 34.3 g was 170 per cent heavier than the lightest (12.7 g).

Whitethroat *S. communis*

S. c. icterops recorded. Some birds overwinter, but the majority continue further south. They occur through most of the country, but only once west of 36°E and none at all east of 45°E. Mean weights before departure in May (20.68 g) are 58 per cent above the lowest mean monthly weights (13.13 g). The heaviest bird at 22.1 g was 103 per cent heavier than the lightest. First arrival date was 26 August and the last departure 14 May; there are relatively few records 2 December – 15 March.

Lesser Whitethroat *S. curruca*

S. c. curruca recorded. Birds are present 16 September until the first week of May, and probably all overwinter; there are no records from further south in Kenya (Britton 1980). They are widespread in north and central regions south to 8°N, and thereon down the Rift Valley to 5°30'N; always scarce east of the Rift, and there are none west of 36°30'E, nor east of 42°E in Ethiopia. Mean weights before departure in March – April (12.60 g) are 15 per cent above the lowest mean monthly weights (10.96 g); the heaviest bird at 18.3 g was 101 per cent heavier than the lightest at 9.1 g.

Orphean Warbler *S. hortensis*

S. h. crassirostris recorded. This species reaches the furthest extent of its winter range in Eritrea, and in northeast Ethiopia south to 10°N, occurring between 20 November and 23 March, but is only seldom recorded. It is apparently somewhat nomadic in its quest for seasonal food supplies, and there is little weight variation in the period December – March, and birds probably close to departure at 23.9 g were heavier by only 6 per cent than those with the lowest mean monthly weight. The heaviest bird at 25.3 g was 26 per cent heavier than the lightest at 20.1 g.

Ménétries' Warbler *S. mystacea*

Visitors arrive rather late and depart early, 24 September – 28 February (with the exception of a mid-April record in Ash 1980), presumably consisting of birds near the extreme edge of their wintering range. Mean weights before departure in February (10.47 g) are only 10 per cent above the lowest mean monthly weights in November (9.53 g), suggesting that large lipid deposits may not be required for the relatively short (and possibly leisurely) return journey to breeding areas. The heaviest bird at 12.1 g was 46 per cent heavier than the lightest at 8.3 g. They overwinter through Eritrea, and in the northern Rift Valley, exceptionally as far south as 8°N.

Barred Warbler *S. nisoria*

S. n. nisoria recorded. Probably few, if any, overwinter, and there are no records 22 December – 2 February. Each side of this period birds have occurred from the last week of September to 21 December, and 3 February to the first week of May. Birds appear to move south rather slowly and early arrivals in the northern part of the

country, seldom visited by ornithologists, may have been missed. Birds occur as early as 19–25 August in coastal Sudan (Nikolaus 1983).

They are widely distributed north of 11°N, then south down the Rift Valley, although they are very scarce to the west and east of it. Mean weights before departure in March – April (23.11 g) are actually lower than of birds in October – December, suggesting that no major weight changes take place and that heavy lipid levels are not required prior to migration. The heaviest bird at 28.0 g was 50 per cent heavier than the lightest (18.7 g).

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Short communications

Birds recorded from the Loliondo area of northern Tanzania

The Loliondo Game Controlled Area of northern Tanzania lies in the heart of Masailand, to the east of the Serengeti National Park and immediately south of the Loita Hills and the Ngurumans in southern Kenya, while further to the east is the Rift Valley escarpment and Lake Natron. The altitude ranges from 2000 m on the plains to over 2500 m on the Olosha and Loliondo hills.

Forest covers the eastern and southeastern slopes of the hills around Loliondo township, and is the most northerly area of forest of northern Tanzania that lies east of Lake Victoria. It is in effect a southerly extension of the Loita Hills and the Nguruman Forest. From an ornithological standpoint the area is little known, though E.G. Rowe did make a small collection of forest birds from there in October 1931, and which were later deposited in the British Museum.

At the time of my visit, 29 May – 3 June 1993, the area was unusually dry, the April – May rains having failed over much of the area, and no species were breeding. Table 1 lists all species recorded, while those of noteworthy distributional interest are summarized below.

Lemon Dove *Aplopelia larvata* Two birds on 31 May were the first records from this area of northern Tanzania, though it is known from the nearby Ngurumans.

White-headed Wood Hoopoe *Phoeniculus bollei* A group of three birds on 30 May was the first record of this species from Tanzania in recent decades.

Silvery-cheeked Hornbill *Bycanistes brevis* A pair seen on several occasions 2–3 June. This species ranges widely east of the Rift Valley, occurring to the west of it only at Loliondo and the Ngurumans.

Moustached Green Tinkerbird *Pogoniulus leucomystax* One on 2 June was the first record from northern Tanzania west of the Rift Valley, though it is known from the nearby Ngurumans.

Red-throated Wryneck *Jynx ruficollis* Singles observed 2–3 June were the first records from northern Tanzania in recent years.

Fine-banded Woodpecker *Campethera tullbergi* Two birds observed 2–3 June were the first records from northern Tanzania, and only the second known locality in Tanzania, all previous records being from the Mahari Mts, near Lake Tanganyika.

Brown-backed Woodpecker *Picoides obsoletus* One on 1 June, and two on 3 June were the first records in northern Tanzania away from the Crater Highlands.

Purple-throated Cuckoo Shrike *Campephaga quiscalina* A pair observed almost daily were the first records of this species from northern Tanzania in recent years.

Yellow-whiskered Greenbul *Andropadus latirostris* Several observed 2–3 June were the first records of this species in northern Tanzania east of Lake Victoria.

Abyssinian Ground Thrush *Turdus piaggiae* A single bird observed on 30 May was undoubtedly that of the little known race *rowei*, and was probably the first record of this form since its discovery in 1931.

Grey Apalis *Apalis cinerea* **Brown-headed Apalis *Apalis alticola*** The presence of both species at Loliondo extends their area of sympatry from the nearby Ngurumans (Turner 1992).

Eastern Double-collared Sunbird *Nectarinia mediocris* Several seen daily represented an extension of known range from the Crater Highlands.

Brown-capped Weaver *Ploceus insignis* Pair observed 3 June was the first record from northern Tanzania, and only the second known locality in Tanzania, all previous records being from the Mahari Mountains near Lake Tanganyika.

Abyssinian Crimson-wing *Cryptospiza salvadorii* Several seen daily at Loliondo represented an extension of range from the Crater Highlands.

Black and White Mannikin *Lonchura bicolor* Several groups of the race *nigriceps* were seen almost daily, representing a considerable northward extension of range from Ngorongoro Crater.

Table 1. *Birds recorded from the Loliondo area*
Nomenclature follows Britton (1980) where scientific names may be found

	Forest and forest edge	Non-forest
Hamerkop		x
Woolly-necked Stork		x
Rüppell's Vulture		x
Egyptian Vulture		x
Bateleur		x
African Goshawk	x	
Tawny Eagle		x
Verreaux's Eagle		x
Augur Buzzard		x
Crowned Eagle	x	
Hildebrandt's Francolin	x	
Scaly Francolin	x	
Lemon Dove	x	
Olive Pigeon	x	
Tambourine Dove	x	

continued

	Forest and forest edge	Non-forest
Green Pigeon		x
Hartlaub's Turaco	x	
African Wood Owl	x	
Montane Nightjar	x	
Little Swift		x
Black Swift		x
Speckled Mousebird		x
Narina's Trogon	x	
Cinnamon-chested Bee-eater	x	
Hoopoe		x
White-headed Wood Hoopoe	x	
Silvery-cheeked Hornbill	x	
Crowned Hornbill	x	
Moustached Green Tinkerbird	x	
Red-fronted Tinkerbird	x	
Black-throated Honeyguide	x	
Lesser Honeyguide	x	
Wahlberg's Honeybird	x	
Red-throated Wryneck	x	
Little Spotted Woodpecker	x	
Fine-banded Woodpecker	x	
Brown-backed Woodpecker	x	
Bearded Woodpecker	x	
Rufous-naped Lark		x
Red-rumped Swallow		x
Grey-rumped Swallow		x
Black Rough-wing	x	
White-headed Rough-wing	x	
Banded Martin		x
Black-headed Oriole	x	
White-necked Raven		x
White-bellied Tit		x
African Hill Babbler	x	
Black Cuckoo Shrike	x	
Purple-throated Cuckoo Shrike	x	
Grey Cuckoo Shrike	x	
Yellow-whiskered Greenbul	x	
Mountain Greenbul	x	
Olive Mountain Greenbul	x	
Common Bulbul	x	

	Forest and forest edge	non-forest
Robin Chat	x	
White-browed Robin Chat	x	
Red-capped Robin Chat	x	
Capped Wheatear		x
White-starred Forest Robin	x	
Olive Thrush	x	
Abyssinian Ground Thrush	x	
Cinnamon Bracken Warbler	x	
Grey-backed Camaroptera	x	
<i>Cisticola</i> sp.		x
Hunter's Cisticola	x	
Mountain Yellow Warbler	x	
Brown Woodland Warbler	x	
Yellow-breasted Apalis	x	
Grey Apalis	x	
Brown-headed Apalis	x	
Tawny-flanked Prinia	x	
White-eyed Slaty Flycatcher	x	
Dusky Flycatcher	x	
Paradise Flycatcher	x	
Plain-backed Pipit		x
African Pied Wagtail		x
Black-backed Puffback	x	
Tropical Boubou	x	
Grey-headed Bush Shrike	x	
Brown-headed Tchagra	x	
Black-headed Tchagra		x
Fiscal		x
Violet-backed Starling	x	
Blue-eared Glossy Starling	x	
Red-winged Starling	x	
Collared Sunbird	x	
Amethyst Sunbird	x	
Bronze Sunbird	x	
Eastern Double-collared Sunbird	x	
Golden-winged Sunbird	x	
Variable Sunbird	x	
Yellow White-eye	x	
Baglafaecht Weaver	x	
Brown-capped Weaver	x	

continued

	Forest and Forest Edge	Non-Forest
Spectacled Weaver	x	
Yellow Bishop	x	
Pin-tailed Whydah		x
Abyssinian Crimson-wing	x	
Yellow-bellied Waxbill	x	
Crimson-rumped Waxbill	x	
Quail-finch		x
Black and White Mannikin	x	
Yellow-rumped Seedeater		x
Thick-billed Seedeater	x	
Streaky Seedeater	x	
Yellow-crowned Canary	x	
African Citril	x	
White-bellied Canary		x
Brimstone Canary		x
Total 110 species	80	30

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Scopus 17: 124–128

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Bird surveys of three reserves in northwestern Uganda

In the course of bird surveys of some of Uganda's Tropical Forest Reserves, under the auspices of the IUCN Tropical Forest Programme, visits were made to the Mt Kei White Rhino Sanctuary (3°40'N, 31°10'E), the Otze Forest White Rhino Sanctuary (3°42'N, 31°50'E), and the Zoka Forest Reserve (3°10'N, 31°40'E)—three ornithologically little known areas of northwestern Uganda—in January and February 1992.

These surveys were undertaken at the height of the dry season, and while the Mt Kei Sanctuary was heavily burned over at the time, a large number of species was recorded in all three areas as shown in Tables 1–4.

Records of special interest are summarized below. Nomenclature follows Britton (1980).

Short-toed Snake Eagle *Circaetus gallicus* Singles observed in both Otze and Zoka reserves, thought possibly to be of the form *beaudouini*, though nominate *gallicus* could not be ruled out.

Levant Sparrowhawk *Accipiter brevipes* One adult male observed at close range in the Mt Kei sanctuary 22 January was only the second record of this rare migrant from Uganda.

Blue Quail *Coturnix chinensis* One flushed from dry grassland in Zoka Reserve 2 February was unexpected in the height of the dry season.

White-spotted Pygmy Crake *Sarothrura pulchra* A single adult male observed daily in a narrow riverine strip in the Mt Kei sanctuary 23–25 January.

Bruce's Green Pigeon *Treron waalia* Several groups observed feeding in fruiting fig trees in the Mt Kei and Otze sanctuaries 23–31 January.

Little Green Bee-eater *Merops orientalis* One in the Mt Kei sanctuary 20 January was only the second confirmed record of this species from Uganda.

Dusky Bush Lark *Mirafra nigricans* Several (5–6 birds of the form *erythropygia*, considered by many worthy of specific status) in aerial song and observed daily in the Mt Kei sanctuary 20–22 January.

Fan-tailed Raven *Corvus rhipidurus* A single bird seen daily in the Otze sanctuary 29–31 January. First record of this species from northwestern Uganda.

Dusky Babbler *Turdoides tenebrosus* One group observed in the Mt Kei sanctuary 20 January.

White-breasted Cuckoo Shrike *Coracina pectoralis* Single birds observed on several occasions in all three reserves.

White-throated Greenbul *Phyllastrephus albigularis* Oddly, the only pycnonotid present, yet abundant throughout the Zoka Forest Reserve 1–7 February. The first records of this species from northern Uganda.

Grey-winged Ground Robin *Dryocicholoides poliopterus* A pair observed daily in narrow riverine streambed in Mt Kei sanctuary 23–25 January were the first records of this species from northern Uganda.

Great Reed Warbler *Acrocephalus arundinaceus* A single bird netted in the Mt Kei sanctuary 20 January may have been wintering in the area.

Red-pate Cisticola *Cisticola ruficeps mongalla* Several birds observed in all three reserves, though none were in song at the time.

Foxy Cisticola *Cisticola troglodytes* A few individuals observed in the Mt Kei and Otze sanctuaries.

Red-winged Grey Warbler *Drymocichla incana* A pair observed daily in the Mt Kei sanctuary 20–22 January.

Gambaga Flycatcher *Muscicapa gambagae* A single bird observed in the Mt Kei sanctuary 20 January.

Pygmy Sunbird *Anthreptes platurus* Common throughout all three reserves, with over 20 males in full breeding plumage observed during the period 20 January – 7 February.

Palestine Sunbird *Nectarinia osea* A single male observed at close range in Mt Kei sanctuary 20 January was the first record of this species for Uganda and East Africa. Presumed to be of the race *decorsei*, known from adjacent areas in southern Sudan (Nikolaus 1987).

Dybowski's Twinspot *Clytospiza dybowskii* Parties of up to ten individuals observed daily in the Mt Kei and Otze sanctuaries 23–31 January. First record of this little known estrildid from Uganda and East Africa, though known from adjacent areas of southern Sudan (Nikolaus 1987).

Black-faced Firefinch *Lagonosticta larvata* A few pairs observed daily in the Mt Kei sanctuary 23–25 January.

Cabanis's Bunting *Emberiza cabanisi* A single bird, presumably of the nominate race, observed in Mt Kei sanctuary 20 January.

Brown-rumped Bunting *Emberiza forbesi* Singles observed in the Mt Kei and Otze sanctuaries 24 and 27 January.

Tables 1–4 list all species recorded in each reserve during the period of the surveys. Scientific names are not given but may be found in Britton (1980).

Table 1. *Mt Kei White Rhino Sanctuary 20–25 January 1992. Surveys were conducted at two sites within the sanctuary; at Chei from 20–22 January, and at Kei from 23–25 January*

	Chei	Kei
Forest species		
White-spotted Pygmy Crane	x	
Black and White Casqued Hornbill	x	

Chei Kei

Forest species *continued*

Grey-winged Ground Robin

Olive Sunbird

x

Green-backed Twinspot

x

Semi-forest species

African Goshawk

x

x

Brown Parrot

x

x

Ross's Turaco

x

White-crested Turaco

x

x

Yellowbill

x

Woodland Kingfisher

x

x

Pygmy Kingfisher

x

Green Wood Hoopoe

x

x

Yellow-throated Leaflove

x

Snowy-headed Robin Chat

x

x

African Thrush

x

Grey-backed Camaroptera

x

x

Paradise Flycatcher

x

x

Northern Puffback

x

x

Tropical Boubou

x

x

Violet-backed Starling

x

Yellow White-eye

x

x

Baglafecht (Stuhlmann's) Weaver

x

x

Spectacled Weaver

x

x

Paleartic Migrants

Levant Sparrowhawk

x

Eurasian Swallow

x

Rock Thrush

x

Northern Wheatear

x

x

Redstart

x

Whinchat

x

x

Great Reed Warbler

x

Willow Warbler

x

x

Table 2. *Otze Forest White Rhino Sanctuary 25–31 January 1992. Surveys were conducted at two sites within the sanctuary; one in the north from 25–28 January, and one in the south from 29–31 January*

	Otze North	Otze South
Forest species		
Narina's Trogon	x	
Green-backed Twinspot		x
Semi-forest species		
African Goshawk		x
Red-headed Lovebird		x
Brown Parrot	x	
White-crested Turaco	x	x
Giant Kingfisher	x	
Woodland Kingfisher		x
Green Wood Hoopoe		x
Red-shouldered Cuckoo Shrike	x	x
Yellow-throated Leaflove		x
Snowy-headed Robin Chat		x
African Thrush	x	x
Grey-backed Camaroptera	x	x
Paradise Flycatcher	x	x
Northern Puffback	x	x
Tropical Boubou	x	x
Violet-backed Starling	x	x
Green-headed Sunbird	x	
Yellow White-eye	x	
Baglafaecht (Stuhlmann's) Weaver	x	
Spectacled Weaver	x	
Palaearctic Migrants		
Steppe Eagle		x
Booted Eagle		x
Blue-cheeked Bee-eater		x
Eurasian Swallow		x
Tree Pipit	x	x
Grey Wagtail	x	

Table 3. Zoka Forest Reserve 1–7 February 1992. Surveys were conducted at two sites within the reserve; one in the north from 1–5 February, and one in the south from 5–7 February

	Zoka North	Zoka South
Forest species		
Scaly Francolin		X
African Wood Owl	X	X
Narina's Trogon	X	
Blue-breasted Kingfisher	X	X
Black and White Casqued Hornbill	X	X
White-throated Greenbul	X	X
Olive Sunbird	X	X
Semi-forest species		
Klaas's Cuckoo	X	
Woodland Kingfisher	X	
Pygmy Kingfisher	X	
Broad-billed Roller	X	
Green Wood Hoopoe	X	
Snowy-headed Robin Chat	X	X
Grey-backed Camaroptera	X	X
Paradise Flycatcher	X	X
Northern Puffback	X	
Tropical Boubou	X	
Violet-backed Starling		X
Collared Sunbird	X	
Yellow White-eye	X	
Spectacled Weaver		X
Compact Weaver	X	
Palaeartic migrants		
Steppe Eagle		X
Harrier sp.	X	
House Martin	X	
Eurasian Swallow	X	X
Sand Martin	X	X
Rock Thrush		X
Pied Wheatear	X	
Whinchat	X	
Willow Warbler	X	
Tree Pipit	X	X

Table 4. *A comparison of the Mt Kei, Otze and Zoka avifaunas*

	Mt Kei		Otze		Zoka	
	Chei	Kei	N	S	N	S
Non-forest species						
Hamerkop			x			
Woolly-necked Stork						x
Hadada					x	
Hooded Vulture			x		x	
Harrier Hawk		x	x			
Brown Snake Eagle			x		x	
Short-toed Snake Eagle			x		x	
Bateleur	x			x	x	
Shikra	x		x	x		
Tawny Eagle			x			
Wahlberg's Eagle		x		x		x
Grasshopper Buzzard	x	x			x	
Red-necked Buzzard	x	x				x
African Hawk Eagle		x	x	x		
Lizard Buzzard	x		x	x		x
Long-crested Eagle					x	x
Martial Eagle		x	x	x	x	
Fish Eagle			x			
Black Kite	x	x		x	x	x
Black-shouldered Kite	x					
Grey Kestrel			x			
Peregrine Falcon			x			
Kestrel		x				
Blue Quail					x	
Heuglin's Francolin	x					
Crested Francolin		x	x			
Stone Partridge				x		
Helmeted Guineafowl	x			x		x
Black Crake	x					
Speckled Pigeon			x			
Namaque Dove				x		
Red-eyed Dove	x	x	x	x		
Laughing Dove		x	x	x		
Vinaceous Dove	x	x	x	x		
Black-billed Wood Dove	x	x	x			
Blue-spotted Wood Dove		x	x	x	x	x
Tambourine Dove		x	x	x	x	x

	Mt Kei		Otze		Zoka	
	Chei	Kei	N	S	N	S
Green Pigeon					x	x
Bruce's Green Pigeon		x	x	x		
Didric Cuckoo				x		
Senegal Coucal	x	x	x	x	x	x
Scops Owl (<i>O. s. senegalensis</i>)	x	x	x		x	x
Freckled Nightjar	x			x		
Standard-winged Nightjar					x	x
Palm Swift	x	x	x	x	x	
Speckled Mousebird	x	x	x	x	x	x
Blue-naped Mousebird				x		
Malachite Kingfisher	x				x	
Striped Kingfisher	x	x	x	x	x	x
Chestnut-bellied Kingfisher	x	x	x	x		
Red-throated Bee-eater				x		
Swallow-tailed Bee-eater		x		x	x	
Carmine Bee-eater					x	
Little Green Bee-eater	x					
Blue-breasted Bee-eater					x	x
Abyssinian Roller	x	x	x			
Rufous-crowned Roller				x		
Hoopoe (<i>U. e. africana</i>)		x		x	x	x
Scimitarbill (<i>P. c. aterrimus</i>)		x				x
Grey Hornbill	x	x		x	x	
Abyssinian Ground Hornbill	x				x	
Double-toothed Barbet		x	x	x		
Black-billed Barbet	x	x	x		x	x
White-headed Barbet	x	x		x		
Red-fronted Tinkerbird	x	x	x	x	x	x
Black-throated Honeyguide	x					
Lesser Honeyguide	x	x		x	x	
Uganda Spotted Woodpecker				x	x	
Grey Woodpecker	x	x	x			
Dusky Bush Lark	x					
Striped Swallow				x	x	
Mosque Swallow					x	
White-headed Rough-wing					x	
Drongo	x	x		x		
African Golden Oriole	x	x	x			
Black-headed Oriole			x	x		
Fan-tailed Raven				x		

continued

	Mt Kei		Otze		Zoka	
	Chei	Kei	N	S	N	S
Piapiac			x			
Black Tit	x	x				
Brown Babbler	x		x	x	x	
Dusky Babbler	x					
White-breasted Cuckoo Shrike		x	x		x	
Common Bulbul	x	x	x	x	x	x
White-browed Scrub Robin		x				
Sooty Chat					x	
Siffling Cisticola				x		
Singing Cisticola			x			
Red-faced Cisticola	x				x	
Winding Cisticola		x				
Zitting Cisticola	x					
Whistling Cisticola	x				x	
Croaking Cisticola	x				x	
Red-pate Cisticola		x		x	x	
Foxy Cisticola	x	x		x		
Red-winged Grey Warbler	x					
Green-backed Eremomela	x	x				
Yellow-bellied Hyliota	x	x				
Tawny-flanked Prinia	x	x	x	x		x
Moustached Warbler	x				x	
Red-faced Crombec		x				
Pale Flycatcher		x	x		x	
Black Flycatcher	x	x	x	x		
Gambaga Flycatcher	x					
Lead-coloured Flycatcher			x	x		x
Black-headed Batis	x	x		x		
Wattle-eye	x	x		x		x
Blue Flycatcher	x					
Richard's Pipit					x	
Yellow-throated Longclaw					x	
African Pied Wagtail				x		
Grey-headed Bush Shrike	x	x	x	x	x	
Sulphur-breasted Bush Shrike	x					
Brown-headed Tchagra	x					
Marsh Tchagra	x					
Black-headed Tchagra	x	x			x	x
Yellow-billed Shrike		x				
Grey-backed Fiscal			x			

	Mt Kei		Otze		Zoka	
	Chei	Kei	N	S	N	S
Helmet Shrike		X				
Lesser Blue-eared Starling			X	X	X	X
Purple Glossy Starling	X	X	X	X	X	
Violet-backed Sunbird	X			X		X
Pygmy Sunbird	X	X	X	X	X	
Palestine Sunbird	X					
Scarlet-chested Sunbird		X	X	X	X	
Fan-tailed Widowbird		X				
Yellow-mantled Widowbird	X	X			X	
Red-headed Weaver				X		
Black-headed Weaver		X	X	X		
Little Weaver		X	X	X	X	
Chestnut-crowned Sparrow Weaver			X	X		
Grey-headed Sparrow			X			
Dybowski's Twinspot		X	X	X		
Brown Twinspot		X				
Fawn-breasted Waxbill	X	X			X	
Black-faced Firefinch		X				
Black-bellied Firefinch	X	X	X	X	X	X
Red-billed Firefinch					X	
Grey-headed Olive-back	X				X	
Red-cheeked Cordon-bleu	X	X	X	X		
Bronze Mannikin	X	X	X	X		X
Cabanis's Bunting	X					
Brown-rumped Bunting		X	X			
Yellow-fronted Canary	X	X	X	X	X	X

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Notes on *Catharacta* sp., *Sterna bergii*, *S. fuscata*, *Puffinus pacificus* and *P. lherminieri* off Mtwapa, December 1992

On 23 December 1992 at about 10:00, a *Catharacta* skua was observed chasing a Lesser Crested Tern *Sterna bengalensis* approximately 4 km offshore and 11 km north of Mtwapa Creek, Kenya north coast. The tern tried to escape by climbing in a steep spiral but was easily caught by the skua, whereupon it disgorged something that the skua dived after and seized before it hit the water. Later, at about 14:30 on the same day, another *Catharacta* skua, possibly the same bird, was seen 2 km offshore and about 8 km north of Mtwapa Creek. On this second occasion the skua was with a large flock of mixed terns catching small fishes what were being driven to the surface by a shoal of bonito. The skua did not dive, but sat on the water with its wings raised and grabbed at any fish within reach, frequently submerging its head to do so.

The skua was uniformly dark brown above, slightly paler below, with a very prominent whitish patch in the opened wing that encompassed the basal half of the innermost primaries, possibly extending into the basal half of the outermost secondaries. The bill and eye both appeared dark.

In a belt some 15 km wide extending north from Mtwapa Creek, north to the cliffs of Vuma, and between 9 and 27 December 1992, I saw 16 Swift (or Crested) Terns *Sterna bergii* that appeared ill. One was found on shore and was easily captured. The others were at sea sitting on the water, appeared listless and made weak attempts to avoid a boat approaching them. Other fishermen also reported seeing sick terns. Several, including the one I caught, were taken and fed fish. All ate willingly, but all died within a few days. None appeared to have been suffering from oil pollution or from any obvious external trauma. There were greater numbers of Lesser Crested Terns and Bridled Terns *S. anaethetus* in the same general area and fishing in mixed flocks along with *S. bergii*, but no other species exhibited the same symptoms.

In contrast to the same month in the previous year (Parker 1992), there were very few Bridled Terns in the seas off Mtwapa, only five Wedge-tailed Shearwaters *Puffinus pacificus* were seen as singletons. One Audubon's Shearwater *P. lherminieri* was recorded 10 km due east of Mtwapa Creek.

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Parker, I.S.C. 1992. A third Kenya record of Jouanin's Petrel *Bulweria fallax*. *Scopus* 16: 54–55.

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Chestnut-banded Sandplover *Charadrius pallidus* breeding at Amboseli in 1993

Although Chestnut-banded Sandplovers *Charadrius pallidus* have been recorded from a number of sites in Kenya (Lewis & Pomeroy 1989, EA Bird Report 1990), and breeding has been claimed from Lake Nakuru (Cunningham-van Someren 1971), the only accepted breeding site in the country is Lake Magadi (Lewis & Pomeroy 1989). The species has been recorded from the alkaline lakes of Amboseli National Park on a regular basis in recent years (Waiyaki & Bennun 1993, D.A. Turner, pers. comm.). On 31 May 1993 breeding was conclusively proved there when a very small, downy chick was seen with a pair of adults. At least two other pairs were present.

At 07:30 on 31 May I was passing along the murram road north of Ol Tukai Lake when I stopped to watch a scattered flock of Kittlitz's Sandplovers *C. pecuarius* feeding in an area of mud and shallow water which extended for up to 50 m to the main lake to the south. I noticed a female Chestnut-banded Sandplover running along the edge of a pool less than 10 m away and focussed on her with binoculars. Suddenly she flew at one of the Kittlitz's Sandplovers and drove it off. I then noticed a tiny downy chick (estimated at about three days old), mottled grey and white with some black markings. It ran along the water's edge feeding unconcernedly while the female Chestnut-banded continued to drive away any Kittlitz's within 2 m of its progress. The female was joined by a male which also drove off Kittlitz's Sandplovers, creating a discrete area round the chick. After less than 2 min two other pairs of adult Chestnut-banded Sandplovers flew in and, although they tried to join the original pair, they too were driven a short distance off and were thus obliged to watch the proceedings from at least 5 m. They did so attentively as the defensive action continued for a further 3 min. Suddenly the original female squatted on an area of bare mud near a clod and I had the impression that a second chick was under her. The original, feeding chick, stopped, turned, and ran towards her as if to a call inaudible to me. It crawled under her and was still being brooded when we drove off 3 min later. The male was in attendance and the other two pairs were feeding normally.

Kittlitz's Sandplover young of all ages were present throughout the park but occurred in open, dry habitat: there were none at all at this site. The chick with the Chestnut-banded Sandplovers was strikingly grey, black and white with no hint of buff while all the Kittlitz's I saw had a distinct buffish hue to the white, although this coloration may have come from soil. The protective behaviour of the adult pair, and particularly, the acceptance of the chick for brooding, confirmed that this was indeed a young Chestnut-banded Sandplover.

This record represents the first proved Kenyan breeding away from Magadi. Amboseli is around 1200 m above sea level compared with Magadi's 580 m. The relatively 'high' altitude of Nakuru (1755 m) has been cited as a reason for not accepting claimed records of breeding there in the 1960s. This Amboseli record suggests that altitude is not always a significant factor. Indeed, it may be that adventitious breeding by this species, as by other alkaline lake breeders, is to be

expected. As the Amboseli site is readily accessible it should be monitored annually in the breeding season to see if a sustained range expansion has taken place.

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Scopus 17: 140–141, October 1994

Received 15 June 1993

Three-streaked Tchagra *Tchagra jamesi*: a new record for Tanzania

In July and August 1993 I spent three and a half weeks in the Mkomazi Game Reserve in northeastern Tanzania carrying out a bird survey. This was part of a preliminary ecological study of the area sponsored by the Royal Geographical Society of London. A full list of species recorded during the visit, with annotated notes on abundance, is being prepared as part of the writing up of the expedition and will be published in due course. The list includes several of special interest and this note mentions a few of them, in particular what appear to be the first records for Tanzania of the Three-streaked Tchagra *Tchagra jamesi*.

Mkomazi Game Reserve is an area of nearly 3500 km² lying immediately south of the Kenya–Tanzania border to the east of Mt Kilimanjaro and to the north of the Pare and Usambara Mountains. Most of the area is a sloping plain with varying amounts of *Acacia* and *Commiphora* bush. Interspersed are several isolated hills, some of which are high enough to hold small areas of dry montane forest on the tops. Climatically the area is the southernmost extension of the Somali arid zone which extends through much of northeastern Kenya and through the Tsavo National Parks.

I recorded the Three-streaked Tchagra on nine separate occasions in the reserve. Six of these records were close to the northeast border of the reserve between Ndea Hill and just to the southeast of Kavateta Dam, two were in thick bush along a track by the watercourse leading to Ngurunga Dam and the last was about 5 km from Kisima Camp. All were of single birds, and all were seen low down in very thick bushes as is typical of the species where I have seen it previously in Tsavo National Park in Kenya where it was quite common (Lack *et al.* 1980). The head pattern was seen clearly on all individuals, but the song and display flight were not noted.

Individuals of *Tchagra* species, and many others, were looked at very carefully to ensure correct identification. Both the Black-headed *Tchagra senegala* (22 seen) and Brown-headed *T. australis* (ten seen) were also recorded in the area. The impression was that the Black-headed generally occurred in slightly more open habitats (12 of the 22 seen) than the Three-streaked (2 of the 9); and the Brown-headed especially in areas where the dominant trees were acacias. Indeed, the Brown-headed was not recorded in areas classed as Bushland without trees, Wooded Bushland or *Commiphora* Woodland—habitats in which six of the nine Three-streaked were recorded.

These records are not too surprising as the species occurs fairly commonly in parts of Tsavo East National Park in southeast Kenya, which is about 100 km to the northeast of Mkomazi. A few other species also seem to reach their southernmost points, or nearly so, in Mkomazi. These include the Pygmy Batis *Batis perkeo* and the Northern Crombec *Sylvietta brachyura*, the latter being common, but one or two others which were fairly common in Tsavo East are only rare or absent in Mkomazi, for example the Taita Fiscal *Lanius dorsalis* (rare) and Yellow-vented Eremomela *Eremomela flavicrissalis* (absent although Yellow-bellied *E. icteropygialis* is present). These will be documented elsewhere.

I am grateful to the Royal Society of London for an overseas research grant which made the visit possible.

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Thetford, Norfolk IP24 2PU, England*

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Oberländer's Ground Thrush *Zoothera oberlaenderi* in the Impenetrable Forest, Uganda

Prigogine (1985) lists a specimen of Oberländer's Ground Thrush *Zoothera oberlaenderi* from the Impenetrable Forest in the collection of the Los Angeles County Museum. This record was not picked up in subsequent lists for the forest or for East Africa (Bennun 1986, Butynski & Kalina 1989, Short *et al.* 1990) nor in the privately-circulated updated Impenetrable Forest list of Butynski and Kalina. Accordingly SK, who is preparing *Zoothera* for *The Birds of Africa*, wrote to KG to find out if the Los Angeles County Museum really does have such a specimen. KG confirmed that the specimen, LACM #71751, is indeed *Z. oberlaenderi*. It was collected by Andrew

Williams in the Itama area of the forest at 5300 feet (1616 m) on 18 June 1969. It was originally identified as Abyssinian Ground Thrush *Z. piaggiae williamsi*, which explains why it does not appear on pre-1985 check-lists for the forest or East Africa. In 1976 Prigogine himself re-identified the specimen as *Z. oberlaenderi*. It closely matches a specimen of *Z. oberlaenderi* (LACM #67266) from Bwamba Forest, the only differences being that on the Impenetrable Forest specimen the two dusky face markings are slightly bolder and the rufous-orange of the rump and crown is a little brighter. Both are females. Measurements (mm) of the Impenetrable Forest and (Bwamba) birds are: wing chord 99 (100), tail 63 (64), culmen 17.4 (17.2).

The Impenetrable Forest record is a considerable extension of range. The species has hitherto been found only in two disjunct areas: northeastern Zaïre in Ituri, mainly the Semliki Valley, and adjacent Bwamba Forest in western Uganda; and over 320 km further south in southern Kivu, around Kamituga. It inhabits primary lowland and transitional forest, at 700–1300 m in Ituri, 1080–1420 m in Kivu; at 1616 m in the Impenetrable Forest its altitudinal range has been extended upwards by about 200 m.

It should be noted that the re-identification of this specimen from *Z. piaggiae williamsi* to *Z. oberlaenderi* does not mean that the former should be removed from the Impenetrable Forest list, since Prigogine (1985) lists nine other specimens from the forest, eight of them in the Los Angeles County Museum. *Z. piaggiae williamsi* is a synonym of *Z. p. tanganjicae* (Sassi).

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Robin Fuggles-Couchman

Robin Fuggles-Couchman died at home in Broughton, Hampshire, in April 1993: he was 86. Well known to the ornithological community of his time, Robin lived in various parts of Tanzania for almost 30 years, devoting much of his spare time to bird studies. He travelled out to Tanganyika for the first time in 1931, returning for a second tour with the Department of Agriculture in 1949, along with his wife Patricia and their young family. They were based in Kilosa at first, but went on to spend time in Morogoro, Arusha, and finally, Dar es Salaam, where Robin's last Tanganyika posting was as Deputy-Director of Agriculture.

Like all of his generation, Robin's ornithological work was carried out without the support of the field-guides we all now take for granted. Indeed, the vital handbooks of Mackworth-Praed & Grant were only published a couple of years before his retirement to England in 1962. Throughout his life, Robin was an active contributor to the ornithological scene through correspondence and publication, including a series of papers with field keys which appeared in *Tanganyika Notes and Records*. After he returned to England, he contributed papers to *Scopus*, adding to those published in *Ibis* and the *East African Agricultural Journal*. Robin had broader interests too, writing popular articles about angling, the countryside and local history, which appeared in *Rod and Line*, *Country Life*, and both Hampshire and Sussex county magazines.

The appearance of Robin's name in the acknowledgements of both Mackworth-Praed & Grant's 1952 epic, and those of Collar & Stuart's *Red Data Book* in 1985, thirty-plus years later, testifies to his willingness to continue to share his knowledge across two generations of African ornithologists.

When Reg Moreau was based at Amani, in the Usambaras, he and Robin were in regular touch, and Moreau celebrated Robin twice in sub-specific names. Like Moreau, he was fascinated by the montane forests of the Eastern Arc (forests appreciated as critical centres of avian biodiversity). He visited and collected birds in several places, contributing the skins to the British Museum collection.

The first taxon Moreau described was a race of the Grey-backed Camaroptera *Camaroptera brachyura fugglescouchmani*, from specimens Robin had collected in the Nguru Mountains. The second was a race of the Brown Woodland Warbler described as *Seicercus umbrovirens fugglescouchmani* for which Robin had collected the type near Tchenzema in the Ulugurus on 10 October 1937. A long standing member of the British Ornithologists' Union, Robin attended their conference in Reykjavik, Iceland in 1972, and was elected a life member in 1983.

On their return to England in 1962, Robin and Patricia settled first in Gloucestershire, living in Little Rissington and then Chedworth, before settling in Broughton, in Hampshire in 1982. In all these places, Robin was an active contributor to local surveys, to the BTO's Common Bird Census, and to county bird reports. Everyone remembers his constant delight for birds, bringing great humour, knowledge and insight to his observations, and never losing this delight for birds, especially for returning migrants, like Garden Warblers and Lesser Whitethroats, and their first spring songs. Even though his first observations had been made in Africa almost 60 years ago, Robin's enthusiasm never waned, and we enjoyed many happy conversations about Tanzanian birds.

At his memorial, a Swift swept into the church just before the service began; it made numerous passes over the heads of the congregation before finding a perch on the parish standard. It seemed a fitting tribute for a man who had so successfully divided his life between East Africa and England.

John H. Fanshawe

Review

Checklist of birds of the Afrotropical and Malagasy regions

Volume 1: Species limits and distribution by R.J. Dowsett and A.D. Forbes-Watson, pp. 374, £15 inclusive of airmail postage

Volume 2: A contribution to the distribution and taxonomy of Afrotropical and Malagasy birds edited by R.J. Dowsett and F. Dowsett-Lemaire, pp. 389, £15 inclusive of airmail postage.

This long awaited check-list from Tauraco Press is now available. The first volume updates the taxonomy and check-lists of C. M. N. White (1960–1965) and covers not only all sub-Saharan Africa but also the islands that comprise the Malagasy Region. It consists of a full 2176 species list, complete with English, French and scientific names (including synonyms) together with references to the major regional handbooks. The regional tables present the distribution and status of each species in each of the 50-odd countries and island groups. Finally there are complete indexes of all English, French and scientific names used in the book.

It is a handy, easy to use, statistical encyclopaedia of Afrotropical ornithology, essential to everyone working in this field. Whether you need to check if a particular species occurs or breeds in any particular country, how many species there are in any family or genus, or how many there are in the region (or world), this is the book to have on your desk. The indexes at the back, often a constant source of irritation in so many publications these days, are truly superb; whatever species you may be looking for, it is there and easily located. The book is very informative, and a joy to use.

The second book, which is Tauraco Research Report No. 5, contains two papers: one on species distribution (in the form of 53 annotated country check-lists, complete with selected literature references); and the other on taxonomy, discussing reasons for changes to some of the species limits recognized by White (1960–1965) and by other taxonomists.

The second volume is bulkier than the first and is mainly taken up by the 53 annotated check-lists (pp. 1–322), which largely repeat the information given in the first volume, but are presented here in the form of country-by-country lists, complete with a list of useful references. However, it is the final 56-page chapter on the taxonomy of some Afrotropical bird species that I personally found the most interesting and certainly feel it is required reading for anyone working with African birds today.

Clearly the authors have relied heavily on their vast expertise in the field of sound recordings and avian vocalizations, as well as through the examination of many museum specimens. This final chapter is well presented with lengthy discussion and treatment of many genera and complex groups. All in all, both books are value for money and are highly recommended.

Along with other Tauraco Press publications, they are available from Aves a.s.b.l., Maison de l'Environnement, Rue de la Régence 36, B-4000 Liège, Belgium. Sterling cheques should be made payable to Tauraco Press.

D.A. Turner

Cape Rook *Corvus capensis* [no comma, no parentheses, no author's name]; **list of references** at the end of a paper or short communication: authors' family names followed by a comma, then initials, each followed by a full point (= full stop, period); **names of journals**: to be given in full; **books**: after author(s), year of publication and title give the town followed by the publisher. Examples of references:

Ash, J.S. 1993. Changes to the Somalia check-list. *Scopus* 17: 26–31.

Moreau, R.E. 1972. *The Palaearctic–African bird migration systems*. London: Academic Press.

Two copies of contributions, which will be acknowledged, should be typed/printed in double spacing on one side of the paper only, with wide margins all round. Clear hand-written MSS will also be considered. Both English and scientific names of birds should be given when the species is first mentioned, thereafter only one name should be used. The names should be those of a *stated work* and any deviations from this work should be noted and reasons given. Contributions on floppy disk are welcomed, but please still send two hard (= paper) copies.

When you send your contribution on disk, please do not type anything in ALL CAPS unless the combination always occurs in that form (e.g., 'GMT').

Original black and white **photographs** and **line illustrations** should not be larger than A4 (210 x 297 mm). Line illustrations should be on good quality white paper or board, or on tracing material; lettering should be of professional quality or marked lightly in pencil. If you send your paper on disk, please include copies of all graphics as separate documents (files) in the program you used to create them.

Authors of 'papers' receive three copies of their contribution free of charge. Extra copies, which will be charged at cost, must be ordered when the MS is accepted. Send all contributions to the Editor, G. C. Backhurst, Box 15194, Nairobi, Kenya.

East African Bird Report

This normally forms the third issue of *Scopus* each year. Records from Kenya, Uganda and Tanzania are welcomed. Please send them as soon as you can to D. A. Turner, Box 48019, Nairobi.

Records of rare birds are assessed by the internationally-based East African Rarities Committee. If you see a rare bird, it may help to telephone one of the OSC members so that someone else can see the bird.

Ringling scheme of eastern Africa

This covers several countries in the area. Qualified and aspiring ringers should contact the ringling organizer, Box 15194, Nairobi for more information.

E.A.N.H.S. Nest Record Scheme

Details of most kinds of breeding activity are required by the scheme. Nest record cards may be obtained free of charge from the organizer, Dr Leon A. Bennun, Department of Ornithology, National Museums of Kenya, Box 40658, Nairobi.

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